THE

SOUTHERN AGRICULTURIST.

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PART I.

ORIGINAL CORRESPONDENCE.

ART. I.—*On the Culture of Corn, Peas and Pumkins; by* A PLANTER.

"July 2, 1831.

Sir,—Having attempted, in former numbers, on the general managemeut of a plantation in the middle country, to shew how your lands should be cleared, the fields prepared, the manure put on, and the cotton planted and attended, with the remedies for its injuries and enemies, I shall now try to plant a crop of corn and make it. And first, as to the seed, I should select from the most prolific stalks of the preceding year, and change the seed every third year. The flints are generally earlier and being harder, resist better the effects of the moisture of the swamps, make better homony, contain more weight and nourishment per bushel, and keep sounder through the following summer than the gourd-seed; but gourd-seed contains more flour, is easier ground, more digestible with stock, and I think, yields more per acre. I should plant the white gourd-seed for winter use, and the Tuscarora for summer, and house them in the half shuck. The Tuscarora is an eight rowed large grained long eared flinty corn. I should commence to plant in the warmest soil in the first week in March, and so on till early in April. On rich and alluvial soils you may plant as late

as the middle of July and make good corn, and pumkins and cow peas three weeks later in common autumns. Early corn has the following recommendations: It is worked and thinned before cotton needs work, it makes a short stalk and less liable to fall from winds, it fits the season for rain better, and will wait longer for it, it makes a thick and heavy blade which is fit to pull at a more leisure season; and generally makes more per acre. Late corn runs more into stalk and less into grain, its blade is watery and dries up too much, and is not strong food, (the same difference exists between early and very late crab-grass hay) for these reasons I give a decided preference for early planting. Plant three or four times as many grains in a hill as you wish to remain, and deep, as safer from birds and frosts. Frosts may cut down flush with the ground, and the deep-planted will come again, it penetrates deep in light and loose uplands, and very shallow in clays or stiff swamps; you must have observed that fall-sown small grain on light uplands are very much thinned by the winter's frosts, when the grain on the stiff lands are uninjured.

The number of stalks to be left on the acre, should be regulated by the number of bushels you ought to expect from the acre, allowing from 120 to 140 stalks to the bushel; thus lands, to make fifteen bushels, should have 2500; and forty bushels 5,000 stalks. Single stalks perhaps yield most to the acre, double stalks are easiest attended and are to be preferred where you design to make the crop without the use of the hoe. Since Mr. Bellenger's very valuable experiment on the distances at which corn was most productive, I have been observing mine more closely, and find the single stalks disposed to shoot too much—it is planted $5\frac{1}{2}$ by $2\frac{1}{4}$ feet, and thinned in the rows, leaving every other stalk double. As a planter, I give the tribute of my thanks to that gentleman for the minuteness and accuracy of his experiments, and hope he will continue them, as on the establishment of the fact of the proper number of stalks to be left on the acre, many thousand bushels of corn annually depend; but agricultural facts are only to be relied on; on the concurring results of repeated experiments; it may be safe to say that close planting may make the largest crop, but that wide planting will give the surest. Alluvial lands liable to be overflown by the freshets

in the river, and to the depredations of the bill-bug, should be planted very early, and as much as half a bushel drilled in the acre. Your lands being all planted and the corn up, the rich necks may be destroyed by the bill-bug, (a small black bug as long as your nail and half its width, with a proboscis half his length,) and the uplands by the red headed worm and the cut or cabbage worm—the two former are bud-suckers and kill by perforating the stalk halt an inch above the root: it will come again when cut off by the cut-worm. The best remedy for the bill-bug is to burn the roots of the corn and the large weeds of the preceding year, as it forms their winter establishment, and plough up the land in the winter. Steeps for the grain I have never tried, but think it would only prevent the depredations of such as preyed on the grain and not apply to sap-suckers.

The first work to your corn should be to stir it deep and close, so as to give it pulverised earth to push its first roots into in search of food, and this is well done by putting the bar or left side of any mould-board plough to it, or by running a five inch shovel close. As a great deal of corn, by so close an operation, gets half covered with dirt, all your small hands should be close behind the ploughs under the superintendance of some careful head thinning the corn, relieving such as are covered too much, and putting the soil with the fingers to such as the plough may have escaped earthing. Each plough should go two cuts and do five acres a-day, and two hands ought to keep up with one plough; the second ploughing may be done in the same way. The third should be by some plough that would throw the earth on the stalk, and yet let the furrow be as far from it as possible, and it will require four cuts. The fourth ploughing should be the "laying by," and where you can use the hoe I would run three cuts in and near the centre of the alleys, and throwing with two of them earth to the corn, and the third furrow's earth should be drawn up by the hoes to the corn. I prefer a large bed as it covers the guard roots, which from their blunt ends push out the fine white roots that help to fill the ears; where they are not covered, these roots do not push out. Where you have to make your corn without the use of your hoe at all, you must at once see that every working with the plough must throw the earth up to the corn high enough to cover the young grass that springs up between each working. The only reason

that makes it desirable to "lay by" with the hoe, is the fact that corn is very liable to be injured by being ploughed near to, when it is breast high or when it bunches to tassel; and the reason why it is liable to injury is, that it has not time after that breaking of the roots by the plough, to renew them in time to fill the ear; if a fine rain immediately falls on corn too late ploughed, it may prevent injury by forcing its roots out again quickly. I have seen many fields injured by too near and too late ploughing, and I have seen injured fields saved by a timely shower. The critical season with a crop of corn is when it is perfecting its grain; at this time all the beds and alleys should be in fine order and well loosened with the plough, that the fine roots which the stalk then pushes out to the distances of 10 and 12 feet, may be drawing in its supplies—on the order of the land and the rains at this time depend the filling of the corn-crib. It is inadmissible after this to use the plough, and dangerous even to give the light cut of the hoe—the hoeing which the peas among the corn may require, should be done after the corn has reached the roasting ear or later. If on the "laying by" with the hoe all the earth made by the plough is drawn to the beds, and the alleys are bare of loose earth and not therefore in suitable order for the passage of the fine roots across them, I would, immediately after the hoes, run two cuts with a colt's-foot harrow, so as to pulverize the alleys and leave them so; or what is better, when your corn is "laid by" if you have the time and opportunity, litter well with pine straw or leaves all the alleys and beds so as to exclude the sun, it will be a substitute for rain by keeping the land moist, and furnish a fine material for next year's list. I tried this partially in 1828, and shall more fully this year, it is in accordance with good theory, and I have but little doubt will succeed in practice. I think it prudent to plough the two last times in the same direction. Where you do not use the hoe in "laying by," that plough is best to lay by with, which throws the earth the greatest distance, an iron wing (about 14 or 15 inches long, 5 or 6 wide and tapering upwards to a point like a broad-sword) put at right angles on the helve of a shovel, and behind the iron so as to be secured by the same screw and tap, answers better than any I have seen. The iron is bent a little back, so as to answer for a mould-board and is sharpened on the lower edge, and that a little bent forward.

Corn will stand surprising drought till the bearing stage, when it wants abundance of rain; indeed, on rich lands, I think it benefited by it, as there is a disposition in the plant in our warm climate to grow too large. I think soil similar as to fertility will produce much more 10 degrees North of us than here. Should a freshet cover your corn after the fodder has been pulled, break the stalk under the ear and turn it down, it drips out the wet better; I think it preferable to the more usual practice of splitting the shuck and drawing it back, so as to expose the grain to the sun. I have had corn covered in all stages from the grain to the ripe ear, the injury is principally from the deposite of sediment, it will not kill what is not covered more than two days and nights, if it be in running water or such as leaves no sediment, unless it be on corn not well above the ground.

The cow-pea is so general and useful an adjunct to the corn-fields that some notice of it seems proper. I think late planting better than early, I would on rich lands prefer planting in July to April; the best time is in June. Early peas generally suffer by drought and shed their leaves—late planted very seldom suffer in this way, and where so late as not to run into vine but bear on the branch, they are easier gathered. I tried numerous experiments with the early kinds, to see if I could get a crop ripe enough to house in August before cotton picking commenced, but none answered well as to certainty of production; there are some of the crowders that yield a third more peas from the haum, but every thing considered, the old cow-pea takes the lead, it only shares with me the cultivation that the corn gets. Its value as food for man and beast, and to the beast as a substitute for corn and fodder, is too well known and appreciated to need remark. A bushel of peas to twenty pounds of bacon or six pounds of hogs lard, makes a fine material for the labourer to work on—I have never given it as an allowance. The gathering of a crop of peas comes at a season when cotton picking is on hand, and when the provision crop is also, and the time is so little to spare, that an expeditious mode of getting it in is very desirable. I know no better way than the usual one for such as are intended for the slaves. Such as are for your stock may be put away on wet days; or such as are unsuitable for cotton picking. Cut the limbs three feet from the body of

any tree near the size of your leg, and 8 or 10 feet high, sharpen the butt-end and stick it in the ground at some convenient place, and gather the peas and vines of all and stack them on it, in this situation rains cannot rot them and you may house them at your leisure or feed them from the stack. They are also well saved in rail pens as described by your correspondent "*Pisum.*"

The pumkin, as another valuable adjunct to the corn-field, seems entitled to some remarks. It, perhaps, yields more weight per acre than any other article of usual cultivation, and is made only by the share which it appropriates to itself of the ploughing and hoeing of the corn-field—with care they will keep till pumkins come again. Where planted alone they should be singled to distances at least ten feet each way; a peck of cotton-seed or other good manure to each hill, will make a valuable lot of them if convenient to the stable yard; they are heavy of carriage as a horse will eat 150 lbs. in a night. The mode I have found as most convenient for gathering them, is to take the first wet day after the wines are killed by frost, and pile them in small quantities in the corn rows five rows apart, for the convenience of the wagon, covering them with their vines; a smart wagoner in the wagon will catch and lay as many pumkins as two hands will throw to him. All the inferior pumkins, or such as have their stems broken out, should be thrown out at home for immediate use, the good ones should be laid in the houses and not so as to be too heavy on each other, they should be kept cool till very severe weather, and then if covered over with fodder or hay, they will keep a long time; but as this is troublesome and will require much more room, the great bulk of the crop should be put in rail-pens, four square, laid across at bottom with rails, and on them and against the sides with corn-stalks, and filled in with pumkins three feet high, then another rail floor and covered at top with stalks or vines to keep off hard frosts; these of course are made in the fields convenient; they would not keep with a load on them of six or eight feet of pumkins, nor will they keep under hay or fodder if put in before hard weather. Our negroes keep them in their house-lofts all the year through, and with but little care they may be kept through January in the fields.

Having tried to make the corn, the peas, and the pumkins, and put them in a situation to be of most use to you,

we must return to the corn-crop and gather the fodder. There are three modes, and the best is to strip and lay the blades scattered thin in the alleys for the sun to have most effect, if the ground be dry and the weather fair, it may be bound into sheaves any time the next day and carried and stacked convenient for the wagons to carry home. If the ground is wet, it is better pulled and laid between the stalks and may be ready to tie on the next evening. If it be rainy it is best pulled and tied in small sheaves and stuck on the stalks, this is slow work; fodder is but little injured by rain on the day it is pulled, but much injured by it on the next day as the sap is partially dead. I prefer in a bad season to cure fodder in the field and not at home. Fodder in a dry time may be packed away in a week, in damp weather not under three after the pulling; it is safest as a general rule to leave it scattered in the houses for eight or ten days as it cures there well. It is usual to commence hauling home a crop of corn about the first of October, and best in the half shuck, as it keeps better, and they are worth their weight in fodder; but your corn, unsafe from freshets, may be housed a month earlier, and put away in a small bulk.

A word or two about hay before closing this long epistle. Let all hands with their hoes shave lightly where the grass is best, so as to bring as little as possible up by the roots, and to cut on till mid day, the next day then, collect the whole into small stacks into which it will cure well; if threatened with rain unite many stacks into one; more hay may be made to the hand by the grass scythe. I have for some years been in the habit of making hay when it rained, devoting the good weather to the market crop.

I have thus tried to begin with the corn-field, and carry it and its adjuncts, through all the stages, from planting to housing its product, and if I have succeeded in making no blade of grass grow where two grew before, I shall feel that I have done some service.

A PLANTER.

Art. II.—*On Clearing and Ditching; by* Chatham.

"M'Nish's Bluff, Satilla River, July 21, 1831.

Dear Sir,—Your two letters of January and March, I had the pleasure to receive here sometime ago, and as requested, herewith hand you my ideas about clearing land and ditching.

In cutting down land I have never been particular about which way the trees should fall, but if I were, I would have them to go parallel with the beds and not across them, this would facilitate after operations, and avoid a number of artificial ponds of water which every one knows is very disadvantageous to the cotton crop. It is best to have the land underbrushed before the trees are cut down, for if both are cut together the hands are apt to fall the large growth upon the small and leave it uncut. In November, after a few frosts have checked vegetation, a dry time, a clear day and a high wind are embraced to burn off. Light land suffers much from this plan; for you not only burn the leaves which are of themselves good manure, but the soil also, which is a positive loss. The brush of light hammocks should be heaped up, as it is done in the upper country, and not burn the whole surface. Clearing up after this, all the timber above five or six inches diameter are to be left upon the field, and when this is is done, you are ready for ditching. Begin by running two ditches, three feet wide and three deep (not smaller) upon the fence line, forming a good bank between them for the fence to stand upon. Then run two more parallel to each other and twenty-one feet apart, through the lowest part of the field, leveling the earth thrown out, equally *between them.* These (double ditches) are to vent off all the water *of the field,* and the outer one at the fence is to take off all from the swamp and woods, which should not be permitted to pass through. In the centre of each task, a ditch two feet wide and two deep is to be run, emptying into the double ditches on either side and united to the inner one at the fence. If the land be very low it will be necessary to half quarter drain, that is, to lay out another ditch between each of those, or, if the task path be well opened and scraped pretty deep at each hoeing, that may supersede the necessity of a ditch—this is one advantage in having the quarter drains through the centre of the task,

and the other is, each hand has his own ditch which, if to be cleaned by two, is generally very imperfectly done. The earth, it is all-important to have well levelled back fifteen or twenty feet, for if carelessly left near, ditching is of little advantage. After this is completed, so far as ditching is concerned, your field is in first rate order. I have seen but little land in the Eastern district of Georgia, but what required all the draining here spoken of; there are more crops lost for the want of it than from any other cause. In a low flat country like ours, we always have too much rain for cotton, and our great concern should be to get rid of the surplus as speedily as possible; if the beds are wet and boggy, the injury will be just as great as if the whole surface was overflowed. We all know that in an inflammatory fever, bleeding and cathartics are the remedies mainly depended on for a cure—so it is with cotton; it is as powerfully excited by frequent heavy rains and a hot sun, as the animal frame is by fever—ditching is blood-letting; and thinning out well, so that the sun and air may freely pass to its lower limbs, is the cathartic. But Sir, it is time to make the beds, which are to run parallel to the double ditches and across the quarter drains; this, if the land has any considerable descent will prevent washing. Break up the ground well and make good beds, and at the second and third working take out all the small roots and stumps which are in the alley. In addition to this, if previous to bedding, two hoes width are turned up under the bed, I believe it will bring as good a crop of cotton for the first year as it ever will afterwards.

Previous to listing for the second crop, have all the timber, not too large, cut up into convenient lengths for handling and laid in the alley, no matter how sound, and upon these lists, bed and plant. The tap root will not go through but it will around; and it is surprising to see how much will be rotted by the next year. As fast as the logs decay, have the rotten part chopped off and strewed in the alleys also. All timber makes good manure, pine and the rapid growth of the swamps least so of any; but they are better than none—oaks and hickory are almost invaluable. There is no need of argument to prove the advantage of this rotten-wood system, since every one has it demonstrated, by the superior production of the cotton, standing under the droppings of an old tree. More than

one acre to the hand of new ground of the first year, should not be attempted, where the balance is old land; and two of old, and one new, is a crop (of cotton) sufficiently large for any hand. I think it quite a mistaken notion that planting large, increases our crop; in ninety-nine cases out of a hundred, the reverse of the proposition holds good. If with a force of twenty-five hands, I plant seventy-five acres of good land in cotton, I can, from having it in my power to put it in complete order and work it *well*, calculate on fifty bales; but if I plant one hundred and twenty-five, with the same hands, the probability is that I shall scarcely make twenty-five bales, and peradventure may have to buy two-thirds of my provisions. In the first case, planting so little cotton gives me an opportunity of making plenty of provisions. Twenty-five acres of corn well manured will bring twenty-five bushels per acre; which still makes but four acres to the hand, and being planted in February is early laid by; and then I can plant twenty-five acres of slips, and as many close peas. With a large crop of provisions every thing does well; you have fat horses, fat hogs and fat poultry, and at the end of the year, instead of expending the proceeds of the crop for provisions, you *pocket the cash*. To say nothing about the fifty acres of land which is resting, how pleasant is it to have a clean field and a flourishing crop; the hands rise in the morning conscious of being able to finish their tasks by two or three hours by sun—their work is enlivened by jest and song.

I am, respectfully, your obedient servant,

CHATHAM.

ART. III.—*Observations on the Climatizing of Plants; by* GEO. J. F. CLARK.

"St. Augustine, July 6, 1831.

Dear Sir,—I very much doubt, the reality of what we so often read and hear on climatizing or naturalizing plants. This we know, that many kinds of plants originally of a

wet soil, will live and flourish in a dry one; that those of a dry soil will, the most of them, luxuriate in that which is wet; and we sometimes find those of a country of annual frost, bearing the heat of a much more Southern climate, but I have not met with an instance of a perennial plant, the indigenous production of a Southern climate, standing more than a very limited degree of cold on their advance Northwardly: which is the subject point to which we direct the most forceable meaning of the terms climatizing, or naturalizing; as I conceive the case.

For instance, (and we have many here, and of various features and grades of analogy,) let us take the Lime tree: a perennial evergreen shrub-tree, sometimes ascending here, in situations well covered from winds, to the height of fifteen feet. This plant at Cape Florida, lat. 25°, 40′, is indigenous, growing in thickets of their own forming uninjured by cold; while these here (but about 4 degrees farther North) notwithstanding a fine appearance, bountiful product, and bearing fruit and flower nearly all the year round, are assailed, once in eight or ten years, by a frost that cuts them to the ground. And this is, and has been, the situation and progress of old subjects of above sixty years standing; which are nothing more hardy than others planted but a few years since; the same quantity of cold cuts them to the ground alike. Both of them, on an average of years, are very profitable in their returns, though one year in eight or ten is lost, as to fruit, in sending up new foliage.

We have here, too, the sweet Orange tree: another valuable article, not so delicate as the Lime with respect to cold, but which loses nothing of its share in a tropical aversion to frost. Its habitude of more than one hundred years standing has not ameliorated its condition in this matter; the old and the young alike shew marks, every few years, of the hammer of winter; and now and then a few of the most thrifty get cut to the surface of the earth. For it is a very remarkable fact, that the better rooted, and more vigorous the plants are, (probably this is true of every kind) the more roughly they are treated by this invader.

Here (permit me a short digression) is an evidence, how little our reasoning on things we do not comprehend is to be relied on. Some years ago I removed three thousand Sweet Orange plants, of a year's growth, from a seed bed to a piece of vacant ground of the same kind close by, in

order to give them a little more room; leaving about double that number standing in the seed-bed untouched. Within a week a heavy frost occurred; those remaining in the seed-bed were generally cut to the ground by it, while those removed, and yet altogether without any commencement of new roots, scarcely lost a leaf, and grew on immediately after. My neighbours, until they knew better, pronounced the removed parcel all lost; and who, of an hundred that had not known of a similar fact, would not have reasoned the same way? I have had many opportunities since of verifying similar results in plants of many kinds and ages.*

There are certain climates adapted by nature to certain plants, or the plants adapted to them, which amounts to the same thing; and they generally improve in size, production, and fine appearance, as we remove them to the northern part of that adaptation. But, take them a little over it, and they are gone root and branch in a few years, if not in the first; and no art but such as will act as a covering—another jacket—can save them. Nor was that covering continued for ten years, would they be any more able to bear the eleventh without it than the first: because there is a change of nature, a constitutional change, wanting, which we cannot make. Even our Lime trees can, by the aid of a green-house, be made to flourish in Canada; and it is quite probable that they would, by coaxing and keeping down all vegetation, more than barely to live, stand a moderate winter in Virginia. But this would be only doctoring them for the time being, not giving them, in the smallest degree, a non-freezing character.

The Olive, another evergreen exotic, from a warm climate, is considerably more hardy in its resistance of cold—that of this country has not, during sixty odd years, made any impression on it—they grow and bear well wild. The first probably, that ever appeared here, were small plants brought from the island of Minorca, up the Mediterranean, and set out openly on newly cleared live-oak hammock land, and shortly after abandoned. These grew up simul-

* It is affirmed that if the Cauliflower (or Brocoli) at the approach of winter be merely taken up and replanted immediately, they are more likely to survive and flower than if left untouched. An instance is related of the half of a bed of Cauliflowers being thus treated, which survived the rigour of winter, and formed handsome heads, whilst the other half was entirely destroyed.—*Ed. So. Agr.*

taneously with the succeeding growth, disputing the soil with the native oaks. Mr. Penier, a gentleman of old France sent by our supreme executive, in 1820 or 1821, to ascertain the productions of Florida, declared here, that he had no where in Europe seen so large a growth of Olive trees. But this tree like all others has its limits; place it in Virginia unprotected, and I much question its existing a few years, if not destroyed in one.

What a pity it is that our crows do not better know their interest, and ours, in this fruit: they carry them all away before the seed is in a state to germinate; but for this our country would be filled with Olive trees, to our mutual good.

We hear of gardeners bringing delicate plants to stand a foreign winter's cold, and the presumption follows, that such plants continue to do so. But this we do not often, if ever, hear of after. It would be virtually telling us that such plants were originally of a more hardy character than they had been aware of; or that they had been aided for *that* winter by some fortuitous circumstance which do not often occur. In short, I think they have been misled or mistaken, somehow, as my neighbours were about my three thousand orange plants.

With much respect, your obedient servant.

GEO. J. F. CLARK.

ART. IV.—*General observations on the Effects of Malaria, and the best ascertained means of lessening its deleterious influence; by* THOMAS Y. SIMONS, M. D.

"Charleston, August 16, 1831.

Dear Sir,—In compliance with your particular request, yet I confess with diffidence, I will offer you some general observations on the effects of malaria, and the best ascertained means of lessening its deleterious influence. This subject is highly interesting and important, and is

deserving the most serious attention of medical gentlemen. Indeed, I have been surprised that among the many intelligent practitioners throughout our country, having so much experience and observation on the subject, and at the same time so capable, that the public should have received so little information. I trust the views which I shall offer will elicit from some (who have had greater opportunities of observing the particular circumstances connected with the fevers, which prove so distressing and oftentimes fatal to those who live in the country) remarks which may lessen their virulence and frequency. I have always been of the opinion that many improvements might be made in the country, and many useful plans adopted, calculated to enable planters to reside during the summer near their plantations without incurring the risk they now do. At all events, the subject is of so much moment and such intense interest, that I trust, however unworthy the remarks which I may make, that they will be pardoned from the motives which actuate me in making them.

The effects of malaria are felt in every region of the earth where vegetation and moisture exist, producing either remittent, intermittent, or malignant fevers; and a great portion of the human race are early in life swept from the earth, or drag out a miserable existence from this cause. Large cities have in this manner become depopulated, and beautiful villas once the pride of luxury and magnificence, are now the receptacles of pestilence. It is wonderful and melancholy in reading the history of nations, to observe how places once prosperous and healthy have become deserted and left in ruins from their pestilential atmosphere; and this is not to be ascribed alone to meteorological changes, but to other causes better understood and more easily explained. As men aggregate, so do their mutual labours afford to each other more of the luxuries of life, and so do they deviate from the simple rules of nature. Luxury in all its forms are indulged in, bringing along with them their innumerable train of diseases. The surrounding country becomes cleared of all its woods, artificial ponds or reservoirs are made, or rivers turned from their course to beautify or enrich certain spots or supply the city with water, and cultivation is carried on in the highest degree; thus manures of all kinds are deposited, and vegetation the most crowded, various and rank, is produced. Here then are abundant sources of

malaria, and these will account in some degree,* for the changes in the healthiness of countries. In the United States, among many instances, I may refer you to the surrounding country of Philadelphia. The delightful seats and farms where gentlemen formerly resided during the summer, are now deserted by many on account of their sickliness. Many situations have been, no doubt, rendered so from the reservoir from the Schuylkill to supply the city with water. Again, since the clearing of land and improvements of New-York State along the line of the canal, remittent and intermittent fevers have become very common and annoying, and sometimes fatal to travellers, and the same may be remarked of the great lakes. Many places which our elder inhabitants tell us that they and their parents lived at with impunity, are now not habitable in the summer. But during that time what an immense quantity of wood has been cut away from the country near Charleston, to supply that city with fuel; and how much more extensive has been the exposure of the vegetation and moisture to solar influence generating thus, and impregnating the air with malaria.

Dr. M'Culloch in his interesting work on malaria, observes: "A convent at St. Stephano became unhealthy in cutting down some trees; and the extirpation of a wood brought on severe fevers at Velletri during the space of three years, as also happened at Campo Salino, in the Pontine marshes."—Again, "Not to commence from what I have had occasion to mention elsewhere, respecting the plantations and groves which in the times of antiquity, were dispersed through the Roman territory, most evidently the result of design on this very subject, and which very particularly, appear to have been one great cause of the superior salubrity of the Pontine marshes, Lancisi remarks that in later times, there was extirpated near Rome, a forest to the Southward, reaching from the height of Frascati and Albano to the Tiber, and protecting it from malaria so abundantly generated in that quarter by these marshes." "Thus (says he,) was destruction first let in upon the Campagna; but it is since that date that a similiar proceeding seems to have

* The labourers on the farms contiguous to London, where cultivation is carried on in the highest degree, suffer severely from miasmatic fevers, which are very severe, and oftentimes fatal; and many other instances might be adduced.

opened Rome itself in another quarter to the malaria of this immediate tract of pernicious land."

Having made these general observations, to prove how necessary it is that some means should be adopted to obviate the increase and spread of malaria. I shall now enter more into detail, and consider some questions of importance as preventive of its deleterious effects. In the selection of a site for a residence, we attend more to the beauty than the salubrity of the spot. Thus the most elevated situations and those having the best water scenery are selected. This will answer very well for the winter. But those whose destiny it is to live all the year on their plantations must pay some attention to the healthiness of the locality. It has been a matter of observation and experience, that high situations contiguous to low marshy grounds, are much more sickly than level spots. Philosophically to account for this I shall not attempt, although a very plausible hypothesis might be offered, but you wish facts and not speculations.

"In Italy," (says M'Culloch) to whose work we are indebted for a great many facts regarding malaria and its effects, "it has been ascertained that the poisonous exhalations of the lake Aquano reach as far as the Convent of Canaldoli, situated on a high hill at the distance of three miles; this instance further proving that thus far, at least, can malaria be carried by the winds.* In France, at Neuville les dames, above Chatillon, on the Inche, and at St. Paul, near Villars, both situated on high grounds, there are found as many or more fevers than in the marshes beneath where malaria is produced, and the same is generally true all through Bresse, in the Lyonnais. Thus also, the plain of Trappes, near Versailles, is effected by the marshes of St. Cyr, though considerably elevated above them."

* This is somewhat at variance with some facts which I will presently bring to your notice. But I believe that malaria is propagated in proportion to the extent of the surface, and the abundant source from whence it is exhaled; and thus where a small spot will produce disease in its immediate vicinity only; large lakes and reservoirs and swamps, from their extent impregnate the atmosphere more fully with malaria, cannot be so easily diluted and rendered innoxious, and produce cousequently a more extensive influence. That the winds coming from extensive marshes have a prejudicial effect for some distance is highly probable, but whenever there is considerable water intervening its injurious effects are neutralized. The nature of this communication prevents me, however, from entering into a full discussion on this interesting topic.

In Malta, while sickness prevails on a high cliff, the beach below is healthy. Similar facts have been observed in many parts of England. In Sicily, out of seventy-six unhealthy towns thirty-five are on hills or declivities; and our own country if proper observations were made would prove the same results. I have heard of many places in the upper and lower country of our State, which are sickly on the high situations, although healthy on the plains, but not being able to vouch absolutely to the correctness of the statements, I shall not mention them.

It is astonishing what a difference a short distance in the locality of a residence makes in its healthiness. Many instances have been mentioned by writers on malaria. Thus, Lind informs us, that the crews of vessels of war at anchor in Cadiz, near the Island of Sardinia and Pensacola, during the prevalence of fever, in these places were healthy, while all who went on shore took sick. Similar facts are mentioned by Sir Gilbert Blane, Dr. Johnson, and other naval surgeons of experience and observation. In 1824, during the prevalence of yellow fever in Charleston, a Dutch ship was at anchor in the middle of the river, say 300 yards from the city, the crew never came on shore, and an awning was suspended over her, and not one took sick, while every sailor that was liable, that was on board ships near the wharves, were seized with fever. M'Culloch likewise mentions many instances more striking. Thus in certain streets of Rome one side is said to be very healthy, while the other is remarkably sickly. Again, "In the high road between Chatham and Feversham, involving an extent about 20 miles, the ague occurs on the left hand side of the road, while those who live on the right are exempt." But we have abundant testimonies among ourselves. On the road leading to the Charleston Bridge is a residence called Pepoon's farm; the house is near a low gully; no one has been able to live there without being severely attacked with the remittent fever of which many have died, while families live within two and three hundred yards of this place, with perfect safety. On Sullivan's Island, the back beach, where there is low under brush, the soil retains the moisture, and small ponds are interspersed; remittent fevers of a virulent character frequently occur, particularly at what is called the east end; whereas the west on the front beach is re-

markably healthy. At fort Johnson, on James Island, likewise, directly on the beach opposite to Sullivan's Island, and where the fortification was, it is healthy, while two or three hundred yards back it is quite unhealthy. I could adduce many other instances, but they would be quite unnecessary on a point so well established. Whenever the causes which generate malaria are circumscribed, so will its influence be circumscribed, and the reverse of the proposition may be regarded equally true, and this circumstance should be particularly attended to in the selection of a site. The site should be on a level spot, having an abundance of trees, to protect it from the surrounding low marshy or muddy ground as much as possible; that trees are highly advantageous, I think, has been already shewn. One circumstance, I may be here allowed to mention, on a plantation near the city a large and healthy family was raised, latterly the place has been much stripped of its wood to supply the city, since which time no one can reside on it without being sick, and many other cases might be adduced. Whenever it is practicable a pine land situation should be selected, the houses should be some distance apart; no garden or cultivation of any kind should be allowed. The land should be of a sandy, porous nature, becoming quickly dry after rains. The water should be good, and no trees for a considerable distance should be allowed to be cut down.* All ponds or stagnant pools should be drained for some miles off if practicable, and here permit me to remark, that I have been astonished that in many situations were it is so easy to drain off the ponds, that the planters have never thought of doing so. It is impossible to calculate the benefit which would accrue from successful drainings of swamps and ponds when practicable, for in the ratio in which the causes which generate malaria are diminished, will the salubrity of the atmosphere be increased. Whenever drainage is impracticable, the trees around the ponds should never be disturbed but allowed to grow as thick as possible.

* The great error in the Pine Land Settlements is, or was, the crowding the houses too near each other. I believe the practice of cutting the trees or having gardens, is put a stop to. It is to be regretted that on Sullivan's Island, a retreat for health, gardens should be cultivated when they are so expensive, useless and deleterious, and that the houses should be so crowded. And it is equally to be regretted that so many gardens should be cultivated in Charleston; but the gardens are nothing in comparison to the extraordinary and unheard of practice in any other civilized portion of the earth, of filling up lots, and making streets with the noxious and deleterious composite of scavenger's offal.

The next point is the preventive means to antagonize or elude the effects of malaria, and this is a very important consideration. I shall therefore be a little minute on this head.

The great danger to be apprehended is exposure at night. The dews fall most heavily (in which malaria floats) from the sitting of the sun to 10 o'clock, after this time, the Italians think they can safely expose themselves to the night air. That they are less liable cannot be questioned, for their conduct must be influenced by experience; but that they are wholly exempt from fever, we have not sufficient data to decide upon. Those who live in the country should not expose themselves after the sun has set, nor to the early morning dews, but wait until the sun has dispersed them, which are seen floating thick and dense near the rivers and low lands. Whenever an individual is compelled to expose himself to night or early morning air, a cloak or even an umbrella should be used to protect him. This will be found a very important precaution, and in the morning he should always eat something before going out.

It has been a general observation that the system is more susceptible to the impressions of malaria when asleep than awake, arising probably from the diminished power of the system to resist morbid impressions during sleep. Hence in passing through the Pontine marshes of Italy during night, and in Lombardy, the drivers continually admonish the passengers not to go to sleep; and I would here caution planters against the habit of sitting in their piazzas at night where they frequently fall asleep. Two plans are now recommended to obviate the effects of malaria at night, each of which I believe to be highly valuable, and which I shall separately consider.

The first is the use of fire—that keeping fires burning around a house at night and in the morning early, will destroy the influence of malaria, I am firmly persuaded is correct. A friend of mine, a medical gentleman, for many years made it a regular habit to spend two or three nights on his rice plantation every week; but he always as soon as the sun was sitting caused fires to be made around the house, and he never took sick, and I have no doubt many other instances have come under the observation of planters. In a communication in your last number signed "*A Practitioner*," it is stated, that chloride of lime was used in

the camp of sixty soldiers who had to travel through a great extent of country during the sickly season, and that fires were likewise made, and not one got sick. Now I am really disposed to believe, that their safety, in this instance depended, more upon the wise precaution of using fires than the chloride of lime, the valuable qualities of which I shall presently consider. At all events, the combination of the two has left the point unsettled, as to the absolute value of either in this instance, although it proves that conjointly, they are highly valuable.

"As to facts in proof of the utility of fires, (says Dr. M'Culloch in his work on malaria,) Lancisi points it out as to Rome; and even Pliny, long ago, declares the same opinion, quoting further, the authorities of Empedocles and Hippocrates, to the same effect. That Napoleon took the same view of their use, adopting this expedient very largely, and with success, when his armies were occupied in the very worst district of Italy, is a specimen of military experience which may save the necessity of quoting others less decisive. One very pointed case, of a civil nature, is also worth recording; because, while it is always particularly easy to imitate, and has been most unfortunately neglected, the circumstances are such as to interest ourselves, as colonists under some of our least satisfactory experiments of this nature. In this case, the superintendent engaged in directing the cutting of wood in Africa; erected thirty earthen furnaces on the spot where his men were employed, lighting them every day. Before this, he had always from forty to forty-eight of his workmen sick; when in a short time, they were reduced to twelve, then to four, and finally to one." Our negroes likewise have fires lit up in the fields where they work, and their huts are filled constantly, and oftentimes surrounded with smoke, which I have no doubt is a material preventive of the endemic fevers of the country.*

* It is customary, I believe, for negroes to go out early in the morning, previously eating something, a precaution which should be adopted by all persons. They generally build fires around their work; at sun-set or earlier they return home, when they begin to cook, and are in a complete atmosphere of smoke, and their usual time for rambling is about 9 or 10 o'clock at night, when the heavy dews have already fallen. If this be their habit; this with their simple diet, will account for their less susceptibility and greater exemption from fever than the whites.

The chloride of lime and soda have been of late so much spoken of for their power in disinfecting the atmosphere of its noxious qualities, that it is necessary I should particularly notice them here. It may be remarked that these articles are equally valuable, the disinfecting power residing in the chlorine which is disengaged, and therefore any fact confirmatory of the value of the one, may be regarded as applicable to the other. I have for some time used both of these articles in vessels having sickness on board, in correcting bilge water, &c. &c. and have always found their effects every thing that could be desired. I have likewise used them in sick chambers, and during the prevalence of small pox, when they corrected greatly the fetor produced by that odious disease. I used them, so that I might not communicate the infection through my clothes to other patients I had to visit, a precaution which all physicians should adopt in this and other contagious disorders, as measles, scarlatina, &c. &c. A very interesting confirmation of the purifying quality of chloride of lime was published in the *National Intelligencer*, and republished in the *Agriculturist* and Silliman's Journal. The circumstance is this—the Spanish fleet which carried an army to Mexico to attempt the conquest of that country, experienced a storm, which required that the soldiers, although crowded, should be confined below decks; apprehensive of sickness from this cause, chloride of lime was placed in different portions of the vessel, to which cause was ascribed their escape from sickness.

Labarraque, a distinguished French chemist, in recommending his chlorure of oxid of sodium (chloride of soda,) for disinfecting hospitals, prisons, &c. in a note, mentions the following interesting facts: "The Sanitary Council (board of health) of Lazaretto of Marseilles, decreed in 1825, that chlorures should be substituted to fumigations in the Lazarettoes for the purification of the passengers and baggage, of plague patients, and other suspicious diseases, as well as the daily overhauling of vessels at quarantine. In May and August, 1826, the quarantine physicians and health officers who attended the sick affected with ship-typhus, were preserved from the disease simply by the use of chlorures, while in 1818, on the same spot and under the same circumstances, the typhus spread among the health officers and Lazaretto physicians notwithstanding the use of guytonian fumigations." He likewise states from official ac-

counts to the French government from Aleppo, that during the plague there which destroyed upwards of twenty-five thousand souls in a month, a great many lives were saved by the use of the chlorures.

These facts speak strongly in favour of the chlorides. I may remark that M. Labarraque has received premiums from the Society for the Encouragement of National Industry and the Royal Institute of France, and the latter institution recommended the chlorures to be used in the various institutions of government which has been adopted.* The chlorides are now generally used in our vessels of war, and in some merchant vessels, but extremely few, considering the cheapness of the articles and salutary correction of bilge water, so peculiarly obnoxious and offensive.

As the chlorides had proved so powerful in correcting vitiated air and putrescent matter, it was reasonable to suppose they would correct the effects of malaria. Mr. Hugh Rose has given us the result of his interesting experiments on himself which would go to prove the value and power of chloride of lime, and Labarraque whom I have just quoted has shewn some facts of the value of chloride of soda. It will require, however, more extensive experiments to substantiate their intrinsic value in this particular. I would advise by all means their use to those who are compelled to go occasionally, or live in the country, although no one who is not compelled should go into the country unnecessarily, depending upon the efficacy of the chloride. Our planters and medical practitioners have abundant opportunities of making experiments on this interesting subject, and I trust on a subject so important they will not neglect to make the experiments, and give the result of their observations. The chloride of lime may be either used in a paste placed in saucers, or in its dry state placed in different portions of the bed room, and should be renewed every day.

Having thus cursorily brought to your notice the two most powerful agents now known to correct the ef-

* The chloride of soda is spoken of very highly for correcting tainted meats, and preventing putrefaction; as this is a great desideratum, I will mention the process: The chloride of soda with fourteen parts of water, is the strength for correcting meats, which should be immersed in the mixture and previous to cooking must be well washed. For fish or game, cotton well impregnated with the mixture must be stuffed in them, the eyes of fish be removed, and a mixture stuffed there and in the gills, they must be well washed before being cooked.

fects of malaria; our next consideration is the conduct and habits of those who live in the country. It is generally supposed that no risk is incurred, unless a person sleeps at night in the country, but this is not always true. Great exposure to the sun and exercise, and afterwards on returning home throwing off the coat, and setting in a draft of air is a very common but a dangerous custom. Serious evils have likewise resulted from exposure to large ponds or swamps lately drained, the exhalations from which are peculiarly offensive and noxious. Mr. Ives who travelled from the East-Indias to Europe by land, on his arrival at Bagdat, remarks: "Here we are informed, that the Arabs had broken down the banks of the river near Bassora, with a design to cover with water the deserts in its neighbourhood. This it seems, is the usual method of revenge taken by the Arabs for any injury done them by the Turks in Bassora; and was represented to us as an act of the most shocking barbarity since a general consuming sickness would undoubtedly be the consequence. This was the case fifteen years before when the Arabs by demolishing the banks of this river, laid the environs of Bassora under water. The stagnating and putrefying water in the adjacent country, and the great quantity of dead and corrupted fish at that time lying on the shore, polluted the whole atmosphere, and produced a putrid and mortal fever. Of this fever, about 12 or 14,000 of the inhabitants died, at the same time not above two or three Europeans who were settled there escaped with life." Our large reservoirs produce on a smaller scale equally noxious effects. I remember a gentleman who from witnessing the draining of a reservoir to catch some fish, being seized with fever of which he died; and a number of similar cases have come under the notice of others.

It is likewise highly important to attend to diet. We live much too luxuriantly and gross. The fat bacon and butter which are so abundantly used cannot be wholesome. The diet ought to be quite simple and as light as possible. An officer of the navy who had his crew always in a healthy condition, although exposed to a tropical climate, informed me that he attributed this mainly to two circumstances. Having at night-fall awnings spread over his vessel to protect his men from the dew, and substituting onions and vinegar for cheese and butter in the rations, and I have no

hesitation in believing a change of diet and an avoidance of night air would have a salutary influence upon those who live in the country. In exemplification of this let me refer you, among other races, to the Asiatics who live principally, if not altogether, upon a vegetable diet, and the injunction of Moses against the use of swine's flesh, and different species of fish was no more than a salutary principle of medical police, to protect the health of his people. The fact is that our parents coming from cold climates brought with them all the habits and customs of those countries, and they have descended to their posterity, although many of them are highly injurious and unsuitable. There can be no doubt that we live much too gross for the climate. Look at the negroes how healthy they comparatively are, and when taken sick how much milder their disease than the whites. Something of this may be ascribed to particular temperament and constitutional insusceptibility to malaria, but these, I think, greatly depend upon the diet and habits of the individuals from infancy. In confirmation of this we find negroes who live in the city and partake of its luxuries, suffer equally with the whites when exposed to the country air. It has been a moot point whether total abstinence from wines or ardent spirits is most conducive to health in those greatly exposed to malaria. Most writers on the subject have been disposed to think that a moderate use of stimuli is a *sine qua non*.* In Holland and other low countries having an abundance of malaria, a free use of tobacco is indulged in as well as strong cordials or ardent spirits. This, although questionable, may be useful in cold, although I conceive prejudicial in tropical climates. It would be idle for me, however, to occupy your pages on this subject. So much having been and is continually written about it in other periodicals. I am well persuaded, however, a more moderate use of any stimuli, and the abandonment altogether of ardent spirits unless used in great moderation, which is seldom the case, would be of great importance in the preservation of health, among those who live in the country as well as city. It is very important to have the water which is drank and used for culinary purposes pure, and where these are unattainable, the use of filtering stones would be highly advantageous.

* See M'Culloch.

I have thus given you some practical observations on an interesting subject avoiding all speculative points, and have endeavoured to be as plain and as concise as possible. I am aware that nothing new has been presented, but I trust many precautions which I have suggested, may be attended to, and I have no doubt many valuable lives will be spared. Wishing you continued success in your valuable work, I beg you to accept the assurance of my respect and esteem.

THOMAS Y. SIMONS.

J. D. Legare.

ART. V.—*On Hastening maturity of the Figs by the application of Olive Oil; by* T. L.

Mr. Editor,—If every man would give to the public his mite of experimental knowledge, we should in a very few years have a mass of information which would be highly profitable to mankind. This observation is intended to apply in a very special manner to agriculture. Theories are useful, they lead to experiment; but successful experiment well established by repeated trials, are like a chart of a hitherto unknown coast; they are safe and profitable. We have often heard (but we hear so many things which are not true, that the information has been unheeded) that figs may be matured by the simple and easy process of applying a single drop of olive oil to the centre of the flower end of the fruit when it is about half grown. Taking great delight in these things I went into my garden the other morning and with a small twig applied the oil in the manner indicated above. The result has completely satisfied and surprised me—whilst every other fig on the tree remained apparently stationary, those which were touched with the oil, in less than 24 hours began to swell, and I yesterday picked one perfectly ripe, and shall to-day gather others matured in the same way. The experiment was complete; figs on the same branch remain stationary, whilst those which were oiled in a few days reached a luscious ma-

turity. Let every man who has a fig-tree try the experiment for himself. It will cost very little trouble, and he will be compensated by getting ripe figs for his table, I believe, at least, a fortnight before those who do not use this simple mean. I would here observe, that my operation was on the East side of the tree, having the morning sun. A tea spoonful of oil will be sufficient, I think, for 500 figs. I should like through your useful work to learn the success of the experiment by others. T. L.

We had made several experiments on the application of oil to the fig prior to the reception of this communication, these were detailed in a paper read before the Horticultural Society of Charleston, and will be published in some future number.—*Ed. So. Agr.*

ART. VI.—*On transplanting during summer; by* AQUARIUS.

Sir,—I have no doubt but you have experienced difficulty in getting your plants to take root when transplanted in dry weather, if you have not, I can assure you I have. I now transplant whenever my plants are ready, without regarding the state of the weather, with an assurance of their taking root, even under the influence of a hot sun. My plan is as follows:—Suppose the bed to have been prepared the day before; the following morning the holes are made, at the proper distances, with a dibble or spade, according to the nature of the plants which are to be set out, these holes are then filled with water, to saturation; in the evening these holes are again opened for the reception of the plants. After the plant is set with the dibble, I make a sloping hole about four inches from the plant, whose lower point will reach the root; this is filled with water in the common operation of watering which is performed every evening whilst the plants require it. Since adopting this plan I have succeeded in planting out between one and

two hundred plants at a time, in a season of drought and heat without hardly losing a plant from its not taking root; and have, moreover, been surprised to see how little, comparatively, the plants droop, although under the influence of a hot sun.

Every gardener is aware of the loss of time in bringing his plants to maturity by waiting for moist weather to set them out, and of the almost impossibility of getting water to reach their roots when simply poured on the surface by artificial means. This same plan is equally efficacious when adopted in planting shrubs or trees.

AQUARIUS.

ART. VII.—*On Gama Grass; by* AGRICOLA.

"Grovehill, P. O. Clarke County, Alabama, July 10, 1831.

Sir,—The considerable interest created by the late account of the *Gama* grass and a notice that Mr. Ellison, of South-Carolina had discovered what was supposed to be the *Gama*, induces me to forward you a blade of 18 *days growth*, and the *end* of a seed stalk containing the seed with *six* seed at maturity, and ready for planting—by a comparison the thing may be readily determined. I am induced to believe it will be found that this extraordinary grass belongs to the Western and South-Western Prairies. The single bunch from which the enclosed was taken would weigh about 14 lbs. of green grass. You will see that about 3½ inches only of the enclosed seed-head comes to seed, the balance, a kind of bloom falls off. The seed stalk measured 7 feet high. Respectfully,

AGRICOLA.

Our correspondent is mistaken in supposing that the Gama grass "belongs to the Western and South-Western Prairies." It is found in South-Carolina in considerable quantities, but like many other valuable native plants, has been entirely overlooked.

About five years ago we had our attention called to it by John Hume, sen. Esq. who showed it to us growing on his plantation in St. Andrew's Parish. No experiments have been made, (as far as we are aware) to test its value in this State, under culture, and the great difficulty which attends the gathering of the seeds, will retard its general introduction for some time. It is certainly desirable that our planters should turn more of their attention to the culture of grasses, the time is rapidly approaching when they must do so, and we believe that the sooner this is effected the better will our agriculture become. Most of the foreign grasses have been tried, and have generally been only productive of disappointment, and this perhaps has caused the great indifference which prevails relative to this subject. We need not, however, resort to foreign grasses. We have many native ones, which will supply their places and to us prove much more valuable. For winter, the Elymus Virginicus is most excellent, affording an abundant supply of green food from November to May, and the Gama grass promises to be equally as valuable for summer use. That our readers may be acquainted with its value we subjoin, a letter written by "*Agricola*," to the Editor of the *American Farmer*. Of this grass we know nothing from our own experience, never having seen it but once, it is familiar, however, to many of our planters, and in candour we must say, they all consider it a coarse grass—none, however, have cultivated it. We will esteem it a favour to be supplied with as much seed as any of our friends can collect, as we have already had several applications for it. The blade of grass sent to us measured 3 feet 8 inches long. This, together with the seeds are left at Mr. A. E. Miller's office for the inspection of those who may wish.

"*Gama Grass.*—The following letter on the subject of Gama grass, will be read with intense interest by all our agricultural friends. We have carefully examined the head of the grass which accompanied the letter, and find it beyond all doubt to be the *Tripsacum Monostachyon* of botanists. Elliott describes it clearly, and in Loudon's Encyclopædia of Plants the description is illustrated by a drawing, which corresponds with the head we have received so exactly, that, even were its botanical character not clearly defined, we should have no room to doubt its identity. We regret that our correspondent in the hurry of preparing his communication, has omitted to indicate his place of residence—

even the usual post mark is omitted on the envelope. We beg our correspondent to favour us with as much of the seed as he can spare, and we will take good care to test its adaptation to our climate and to give it as wide a distribution as the quantity he may send us will allow of.

Mr. Smith—In your valuable "Farmer" of the 29th of April, I find a short (I presume) editorial communication on the subject of the "*Gama grass.*" The one from the "Mobile Register," I forwarded to that paper, the grass it alludes to having been procured by me from Dr. Hardeman of Missouri. Mr. W. D. of Pennsylvania confines its value, I presume he means its *productiveness*, to *prairies*, and low wet grounds. This statement being so pointedly at variance with my experience, induces me to state to you that my plat of this grass is on a perfect sandy pine land, on a strata of red clay. That this soil is found amongst the driest known is well ascertained. Some cause not fairly ascertained must have been unfavourable to this gentleman's trial of this grass, or mine and his cannot be the same. On my dry sandy land *manured*, I am perfectly certain that by cutting every fifteen days the production would exceed three hundred thousand pounds of green grass per acre, during the months we can cut it in this climate, say from the 1st of May to the 1st of November.

By adding calcareous matter to the soil I am equally certain that it would be produced in great quantity, its native spot being a limestone, land of the kind usually called soft or rotten limestone, a species of limestone found in all prairie lands.

Last year was the most trying drought perhaps ever known through this section of country. This grass was nearly as luxuriant as the previous season. When all surrounding vegetation was literally burnt up, it was green and flourishing. During the month of July it grew forty-three inches. We have copious dews. With the section of prairie country sweeping from Georgia to Missouri I am well acquainted, and their vegetable productions, especially grasses. I have never seen this grass east of the Mississippi.

The seed stalks now about six feet high are in full seed, and a bloom hanging from the seed resembling the bloom on rye, but of a reddish cast. I have enclosed you a blade of eighteen days growth, and the head of a seed (a short one) in bloom. When cut at fifteen days it is peculiarly sweet and delicate, but I presume not so nutritive as when at its full height, which appears to be about four feet, and which it reaches in about a month. I have been particularly attentive to the tall grasses of this and the adjoining states, and have never been able to find it amongst them—although many that resemble it. When the gama grass is made into hay it becomes of a singularly agreea-

ble flavour—it is easily cured—twelve pounds of green making five pounds of hay.

I will forward you a few of the seed, and from them alone it can readily be determined whether this grass is found in the old states. I am strongly of the opinion it is not, and that it is one of the native productions of the south west. How your climate may suit it I do not pretend to say, but this produces it admirably. It has an astonishing root, not only for penetrating the earth, but in diameter. The fourth year many of the plants shew a root of ten inches in diameter at the surface of the ground. From the manner in which they grow, I am satisfied, with us, that the plants set at two feet apart would find the roots meeting in 6 or 7 years, and that the ground would be completely occupied by them. This grass stands up handsomely for cutting with the sickle or scythe, the blade proceeding from the root almost—and consequently would be admirable for soiling. Its singularly nutritive qualities are well attested.

I have been in the habit of placing the signature of "*Agricola*," to all communications of an agricultural kind which I have made for years back.

Very respectfully, your obedient servant,

JAMES MAGOFFIN.

ART. VIII.—*Proceedings of the Horticultural Society of Charleston.*

August 10, 1831.

The meeting of the Horticultural Society held on the 10th of August, was like that in July well attended. There were but two boquets of flowers exhibited—these were, from the gardens of Mrs. Cochran and Mrs. Bachman, and consisted of rare plants. We were gratified in finding even these there, for the season of the year did not admit of any great or varied display. The deficiency of flowers, was however, amply made up for, by a large and handsome collection of fruits, consisting of grapes, pears, peaches, nectarines and melons.

Mr. William L. Ingraham sent to the Society some very handsome bunches of the *Muscat Rouge* grape, and a basket of *sugar pears*. Some bunches of the *claret grape* sent by Mr. J. H. Mey, were uncommonly fine, one of the bunches weighed 1 lb. 5 oz. The rest of the grapes were also very fine, but had no names attached to them, they were furnished by Messrs. William

Mathews, C. Graves, Augustus Winthrop and A. G. Rose. A large bunch of the Chasselas de Fontainbleau, was sent by Mr. J. Michel. Mr. Effingham Wagner and Col. Magwood furnished a fine collection of pears. Mr. Landreth exhibited some specimens of the French nobless peach and golden nectarine. Melons were furnished by Messrs. Elias Horry, R. Hume and J. D. Legare. One of the melons presented by Mr. R. Hume, was remarkable for its length and equality of size throughout It was a new variety, the name of which was not known. Mr. Legare exhibited a Valentia or winter melon; also the white Vienna and transparent Vienna Turnips—these differ entirely from the common turnip, and resemble more the Kohl Rabi than the turnip. Mr. Richard Teasdale sent a very fine stalk of White Okra, in full bearing.

The usual business of the Society being gone through with, a paper was read by Dr. I. A. Johnson "On the *rationale* of the action of oil on the fig," after which much desultory conversation took place among the members relative to the merits and culture of the various fruits then on the table, in the course of which Dr. I. A. Johnson suggested the propriety of grafting the foreign vines on native stocks.

Mr. R. Hume had heard this recommended, and understood that it was most successfully done by boring with a gimblet and inserting the graft in the hole thus made—he requested to be informed whether any of the members could state any thing of their own knowledge.

Mr. John D. Legare replied, that he had not the least doubt of the expediency of grafting foreign grapes on native stocks. The facility with which it was done, the certainty of the operation and the time gained, were so many inducements for preferring this mode to any other now practised. In the course of his reading he had come across many communications, (published in various American Journals) on this subject. All of them were much in favour of this process and spoke highly of it; he had met with none which treated it lightly, or as of little use. Some had made use of cleft grafting, whilst others had resorted to boring a hole with a gimblet in the stock and inserting the graft; each was extolled, and he did not recollect of a preference being given to either. He had made a few experiments which had been very successful. One of the vines which was grafted in March 1830, grew that year twenty feet long, having several lateral branches nearly the same length. Intending to layer it, he did not prune, but one branch. On this he counted in May last thirty-two bunches of grapes, and on the whole vine there were eighty-nine bunches:—had it been properly pruned, there is little doubt but that there would have been near twice as many bunches. This tended to show the superiority of grafting over that of planting either cuttings or layers. From neither of

these could fruit have been expected until the third year, and then only a few bunches; whereas this vine actually produced eighty-nine bunches the *second* year of its growth.

Mr. Bachman stated, that he had several times attempted to graft grape vines by what is termed cleft grafting, but had rarely succeeded, the last spring he had tried it by boring, and had been completely successful; he had put two grafts into a vine in this way, and one of them now measured upwards of twenty feet, and the other was not much shorter. He was rather surprised at the result, and it appeared to him rather extraordinary, as this process differed from all others, inasmuch as in grafting fruit trees, it was considered essential to unite the bark of the scion and stock, but in this no such junction took place, and it appeared to be quite immaterial in what part of the stock the grafts were inserted.

Major P. S. H. Lee replied, that success had also attended his efforts, but he was not surprised at the result. It was easily accounted for. In all trees the sap vessels lay between the epidermis and the hard wood, it, therefore, becomes necessary to join the barks of the scion and stock, so that the sap might flow from the one to the other. In the grape vine, the sap vessels pervade the whole body, and therefore, insert the graft where you will, it meets with sap vessels.

Mr. Bachman presented a part of a stem of the white lilly, which had produced a number of small bulbs around the lower part, accompanied with a note from Mr. Wm. Logan, stating that these bulbs were produced under what he considered novel circumstances. A stalk of the white lilly was accidentally broken off last spring and stuck in the ground, without any expectation of producing this result, to his surprise it continued to live, and when examined he found a number of small bulbs formed around it, he considered this as new, and now sent it to the Society for their inspection.* Mr. Bachman said that although as applied to this plant it might be new and useful, yet no new discovery had been actually made, there was a strong propensity in all plants and parts of plants to sustain and propagate themselves by producing roots, and the organs of reproduction, whether they consisted of bulbs or seeds; this was exemplified in a particular manner in the sweet potatoe, the vines from which being planted, produced tubers which served either for the food of man or propagation. He had never, however, known this principle applied to the propagation of the white lilly, and he thought it might prove very useful, the bulbs were medicinal, and sometimes there was a difficulty in propagating this plant by the usual process—the one recommended by Mr. Logan, might therefore be of much service

* Mr. Logan has sent us a full account, which we will hereafter publish.

PAGINATION INCORRECT

Mr. J. D. Legare called the attention of the Society to the winter melon then on the table; it was a variety which possessed some properties which rendered it worthy of the attention of our horticulturists. It is grown in considerable quantities on the shores of the Mediterranean and in the orange gardens of Toulon, from whence the markets of Paris are supplied with this pleasant fruit during the winter. It is also regularly imported into England, and is to be found in their fruit shops every winter. The gentleman to whom he is indebted for the seeds from which this one was raised, had often seen them at Naples and in its neighbourhood hanging by their stems, on the outside of their cottages, exposed to all the vicissitudes of the weather; he had himself eaten them very late in the season, and the one from which he took the seeds was eaten on board the vessel in which he was a passenger in the month of February, and he was informed they were kept much longer. The fruit is not large, generally about eight inches long, the flavour is very good. Mr. Legare stated that his vines had borne but the single fruit, and he could, therefore, say nothing of it as yet from his own knowledge, as he intended to preserve it as long as possible.

In the course of the meeting the following gentlemen were elected honorary members, viz:

THOMAS ANDREW KNIGHT, *of England.*

LE CHEVALIER SOULANGE BODIN, and F. ANDRE MICHAUX, } *of France.*

Gen. H. A. S. DEARBORN, and THOMAS NUTTALL, } *of Massachusetts.*

Dr. HOSSACK, Dr. S. L. MITCHELL, JESSE BUEL, } *of New-York.*

PART II.

SELECTIONS.

ART. I.—*The Ploughman's Guide; or, the Art of Ploughing.*

[FROM THE BRITISH FARMER.]

Should a ploughman turn to remote history, and mark how old the implement is, by which he earns a livelihood, and the honour conferred on his calling by the ancients, he must be awakened with elevated ideas of self-gratulation. But, on the other hand, should he see the name of senator and general, contrasted with that of clown or boor; should he find himself unable to answer one question correctly, respecting the figure, mathematical powers, relative proportions, or working properties of his implement; see the whole knowledge of it arrogated by the cartwright and blacksmith, (who have as little of the principle, and less of the practice,) and himself placed below the rank of a regular bred-tradesman, these ideas must sink in mortification, to the dust; and give place to the mazes of wonder, that his art has made such slow progress; and others of modern date have so rapidly advanced, and engaged so much of the talent and floating capital of the nation. He cannot fail to remark, that while ingenuity and accuracy have been exhausted, in the construction of steam, water, and wind engines, for converting even the raw produce of his labours into more disposable commodities, his implement continues to torture the earth, without any given data, rule, or fixed principle, further—than the custom of the place.* He may remark, too, that while there are schools for the dissemination of all other useful learning, he is obliged, without one lesson, to wrestle with the plough, and contend with the team, till, by dint of experience, he gains some ascendency and command over them.

* As every farmer is in so far, his own master, and every farm different from another in size, soil, exposure, rent, &c. a strict uniformity in measures cannot be expected. But what is more to be regretted, as there is in husbandry "*no real competition*," there can be no "real" emulation, or stimulus to improvement, this is, in all cases, stronger than prejudice. "We cannot reject the produce of the soil." The corn of a badly laboured field, though not so abundant, may taste as sweet, and find as good a market, as that raised by the most enlightened modes of management.

To experienced husbandmen and skilful ploughmen little need be said; but there are farmers almost, in every parish who have not been bred to rural pursuits, such as may be called speculative, theoretical, or pleasure-farmers, who cannot temper a plough, or yoke in the horses; and who even do not know what should in a day be performed by them: except perhaps from inquiring, or making a comparison with what is done by the teams of other farmers. And, although such a farmer may engage an esteemed and well recommended ploughman, yet he is not, as every master ought to be, able to give directions or instructions—to correct any little besetting error; and to maintain in knowledge, as well as in power, that proper ascendency over his servant, which is in all cases, for the interest of both.*

Again, much of the fault remains with but too many practical farmers, who, on the false idea of saving a few pounds, hire their ploughmen, not from any preference to skill, on the evidences of what he has done, but on the appearance of what he may be able to do. It is no matter what he has been, or intends to be: if possessed of sufficient physical strength, he is also sufficient to be thrust between the horns of the plough, which he knows nearly as little about, as of the plough in the firmament:† quite competent to take under his dominion, two of the noblest and most useful of animals, the economy of whose feeding, cleaning, harnessing, training, working, &c. he is as ignorant of, as of rearing and breaking the camel or dromedary:—and, after being attended for a few rounds, to be left to grope his way in the dark, without being told, whether the troubles of his tortuous passage depends most on himself, the yoke or progress of the horses, or on the construction or trim of the plough.

* "Far the larger portion of mankind are slaves to prejudice, indolence, or ignorance; they require to be torn from their errors, to be goaded to exertion, and to be driven to school! Even where there may be a spirit of industry, or a commendable principle, such as induces to exertion in any direction, some unlucky deterioration generally attends. Few relish the idea of serving a tedious apprenticeship to a mechanical profession, in which the whole day is spent in seclusion and labour; but, as is indeed natural, the temptations attendant upon field labour, wherein the eye and tongue enjoy full liberty, rarely fail to gratify the tyro, who, for a few weeks, or months, enjoys as a pastime, all the minor occupations relating to the team, harvesting, &c.; and, after following the plough over a few acres, holds himself to be competently skilled, and accuses providence of neglecting its duty to the world, in not having bestowed on him some farm suited to his unerring judgment, and to his unparalleled abilities! In fact, the generality of country-bumpkins cherish the belief of possessing every requisite—except the soil. Gross error Of all professions, none requires such superiority of intelligence, so much practical knowledge, so much temperance, activity, patience, perseverance, and judgment, as that of the farmer!!!—*Capt. Tho. Williamson*, p. 143, *Agricultural Mechanism*.

† Septentriones; Ursa Major.

No craft can be learned without practice; and no trade, calling, or occupation, that can be so readily leapt into, can ever be lucrative, much respected, or speedily advanced. This must be evident to the farmer, who pleases to observe his horses neglected one day, surfeited the next, and on the third, cruelly abused and knocked stupid, by the unremitted and ill-directed vengeance of their bewildered guide; especially when he comes to compare their condition, with the progress made; the quality of the work, with the quality of the produce; and the time of ripening, with the time of sowing.* It must be clear to the skilful ploughman, who sees his vocation overrun by novices, who go every second or third evening to the smithy, without being able to tell what they want done. It must be gallingly so, when he finds that these sons of Vulcan, who have thus got so far ahead, refuse to work as he orders; and hears opprobious epithets indiscriminately rivetted by them, on ploughmen of all ranks and denominations. How would these apprenticed mechanics stare, if directed by a ploughman, who can handle the forge-hammer better than they can the plough, how to raise and manage a welding-heat! And how would they gape, if told that it is harder to become a good ploughman, than a good smith! I should like to see those men more respected, who beautify the venerable face of our mother earth; and who, taken as a whole, are not only the most virtuous, but also the most useful class of the community. It is on the labours of ploughmen, that we principally depend for the staff of life in the field of aration; and there are none on whom more dependence can be put, for the safety of our lives, liberties, and properties, when their services are needed in the field of battle. I should, therefore, wish to see them maintain their ground, in their own proper sphere.

It would, perhaps, be impossible to give any thing like a system of rules, for the most proper and convenient make, size, weight, trim, &c. of a plough, for all the varieties of soil, or for that diversity to be met with even, in the same ridge; neither shall I make the attempt: but a few rules may be laid down, and observed as axioms in all ordinary circumstances, viz.

1st. The horses should be yoked as near to the plough as possible, without too much confining, or preventing them from taking a free step.

2d. When at work, they should be kept going at a good pace.

3d. The chains or theets should, from where they are suspended over the backs of the horses, point in a direction leading through the muzzle, to the centre of the cutting surfaces of the coulter and share.

* It is contended by many authors, "that if the operations of tillage were better performed, it would add one-third, or at least one-fifth, to the produce of the kingdom."

4th. The implement, when taking the furrow of the dimensions required, should stand upright, and glide onwards in the line of progression, without swerving in any particular way.

5th. The ploughman should walk with his body upright, and without using his force to one point, or showing appearance of inclination, or spasmodic contraction.

These rules are here particularly condescended on, from the reason, that every deviation from them is attended with loss of time and power, and may be observed at first sight.

Why should the horses be yoked near the plough, or drawn with as short chains as possible?

1st. Because in the plough, as well as in the cart, wagon, or any other draught, the uplifting power should never be lost. Without it, more exertion is required to overcome the same resistance; and the impelling power, as if by drawing over a pulley, depends more on weight than strength.

2d. The horses are more manageable.

3d. Less time and room are required for turning them on the head lands, where they will not so oft step over the theets.

To prevent which, to save their shoulders, and give the beam a more fixed, or shorter fulcrum, consequently, cause the plough (among other advantages gained) to go more steadily, the back-band, in place of being put near the shoulder, should pass over about the short rib. Should the team be yoked at the distance of a few yards from the muzzle, the uplifting power would be nearly lost—the smallest lateral obstruction or bias, would send the plough thwart the ridge; and, in going over little heights, there would be no possibility of preventing it from sinking to the beam. As for instance, in crossing ridges a little elevated, when the horse's shoulder was descending into the one furrow, the head of the plough would be ascending from the next; but in place of rising with the curve, it would, by the draught, be carried horizontally forward. In the way recommended, the plough will not only be prevented from side aberrations, but, over every inequality of surface, it will work with the least possible friction, and at the most uniform depth: this being regulated by the position of the hinder legs of the horses, when the back-band passes over as above directed.

Why should the team be kept up at a good pace?

1st. Because if a plough required 7 cwt. of draught to set it a moving; and if the horses were made to lean forward only equal to the lift of 6½, they might thus hang on, without doing any thing, till evening, when the ploughman and they would be more fatigued, than if they had turned up an acre. 2d. There is but a very trifling difference in the resistance made by the plough, when the horses are torpidly crawling and footing it along,

at twelve-inch paces, than when going briskly on. And lastly, the cattle go more steadily forwards, when allowed to proceed at the rate they would incline, than otherwise; and the ploughman (if he is one) will, with less suffering to himself, make the work equally neat, or perhaps more so. If, then, the horses are weak for their work, I would recommend, that they should rather be rested now and then at the headland, than driven slowly and constantly on, that every plough should go at a rate betwixt 2½ and 3 miles an hour at least; and that every ploughman who cannot make seemly work at that speed, in land free of stones, sitfasts, and rocks, should be obliged to try something else.

I shall offer no remarks on the feeding, cleaning, harnessing, and training of the team. Every variety of the cattle, and of circumstances in the owners, naturally call for a diversity in the modes and measures. But before leaving the horse, as in the yoke, I have to observe, that when the animal is in good condition of body, he is also quick, docile, and tractable: and may be driven and managed by the word: but, then, only five or six words are necessary; and these should neither be altered, changed, nor used too frequently. Nothing gives a more inauspicious notion of the man than the hearing of him, in all the variety of language, tone, and tension made use of in the company of his companion, keep up an unceasing tattle with the dumb brutes: now cheering, now praising, now remonstrating, now threatening and ordering; which, as the poor creature cannot distinguish, among the multitude of words used, are ordinarily followed up with vociferations, oaths, yells, and imprecations—with lashing, beating, kicking and cutting, without use or end, meaning or allowance. The jargon of such ploughmen is sometimes very amusing; but is, through the piece, a great annoyance and punishment, to all that are obliged to remain within half a mile, or even a whole one, of some of them, whose organs of sound are capacious, and have full play.

The remark will stand good, that those noted for noise are seldom found to stand high in the list of their calling, and never have well-trained cattle: whereas, on the *per contra*, a well-going plough is like a well-going steam engine, which steals smoothly and quietly along, without unnecessary loss of vapour and power, by useless friction, jolting, and jingling. Whatever qualifications, then, the ploughman may possess, I would caution him against din; and to observe, that if he wishes to be respected by his master, he must not be harsh and unmerciful to his cattle.

There is a villanous method much practised in many places, of binding the heads of both horses back, without any direct connexion between them: than which, nothing I have ever seen in the manner of ruling the team, ought so much to be reprobated.

In this way, the furrow horse has no power over the land one; and the ploughman has no effectual command over either. But this is not all: for the one cannot start a moment sooner, or go an inch before the head of the other. They would both require to be actuated by one and the same life, spirit and fire, if set on by the word of command; and, if need require, that they be goaded forward by the rein, to produce the desired effect, it would be incumbent on the ploughman to strike them both at the same instant, in such proportions as give individually, the same stimulus to action, the half of which, it is impossible for any man to do. If he has, and constantly exercises a sufficient power over their heads, he may prevent them from approaching too closely; but he has no means of regulating the width, and cannot hinder them from being six or eight feet asunder, or keep the furrow horse in his place. Where this mode is followed, there is often, too often, difficulty in distinguishing at first sight, from a little distance, whether the plough is going or standing still; and in short, it is only calculated to murder time, and keep up a continual warfare betwixt the ploughman and land horse.

The untamed and liveliest, or most forward, horse should be put in the furrow, and only bound back to the right, or off-theet of the land-horse, at or near the place where the back-band joins it; at such length, when stretched at the width required, as to prevent his end of the beam, or double-tree from being before the other. And further, the heads of the two should be connected together by a small rope or chain at the distance wanted, giving the furrow-horse power over the other: that is to say, if tender-mouthed, it must be fixed well up on his head, and in the rings of the bit or curb of the other, so that he may have the power of the head, over that of the mouth of the land-horse.

And lastly, the reins should neither be so heavy as, by their stiffness and weight, to confine or burden their heads, nor so light and elastic, as to be inutile for direction, if needed as a whip. They should be held in the ploughman's hand with very little slack, that he may readily, and effectually use them. Thus it is clear, that by turning the head of one, both are turned; by touching the land-horse, which is free and regulates the speed, the other gets forward; and thus I may safely add, a good ploughman not only cares little for the so-much-talked-of steadiness of the land-horse, if the furrow one will only keep his place, but he matters not much, what either be, *if they will only go forward.* I have also to remind such ploughmen as are under the pleasure-farmer, and who have what time they please, to finish their work and train their eye-sweet team; and who, finding little need for the reins, carry them over their shoulders, that should they happen to come under one who farms for profit, and who is changing, training, and initiating horses to the plough, they may

then find necessity, and themselves too, a little awkward in the use of them.

The single trees should be as light as they can be made of sufficient strength; and, whether of wood or iron, so ringed on the end, that the hooks of the chains, when fixed to them, may hang with their points directly downwards or upwards. The beam or double-tree should have three, or five holes in its middle, for the purpose, when circumstances call, of giving the weakest animal the longest end of it.

(To be continued.)

ART. II.—*Prize Essay presented to the Manchester Agricultural Society, at the annual meeting held 28th September*, 1830. *No. II.—An Essay on Cattle; by* JOHN WEIGHT, Esq. *of Chesterfield.*

[FROM THE BRITISH FARMER'S MAGAZINE.]

——— Quæ cura boum, qui cultus habendo
Sit pecori * * * *
Hinc canere incipiam. *Virg. Georg.*

The great attention that has been paid by almost every spirited owner and occupier of land in the kingdom, to this branch of rural economy, shows the importance that is attached to it by those engaged in agricultural pursuits.

During the last century a society, having for its object "the improvement of the breed of cattle," was formed under the auspices of a noble duke, and since that time has been countenanced and supported by many of the nobility and gentry, of whom some were the highest in rank and fortune in the kingdom. Patronized and encouraged by Lord Althorp, and other distinguished characters, the society still continues to flourish, and an annual exhibition takes place in London about Christmas, to award prizes and liberal premiums for *fat* cattle of nearly every description. Similar societies, having for their object the exhibition and encouragement of *breeding* stock, have also been formed in most counties, and in some parts of the kingdom almost every market town has had its kindred institution. Thus one agricultural district seems to have vied with another in promoting a national benefit, by endeavoring to improve in the highest degree, that particular breed of cattle which was indigenous to each. It cannot be denied that many a beautiful specimen of

every species has been exhibited highly creditable to its respective owner. The high price given for choice animals has caused a greater number of the best bulls, of different herds, to be kept even by those who did not rank as bull breeders, hence it was, that superior bulls came within the reach, and into the possession, of smaller farmers, and inferior breeds were thus considerably improved, whilst other circumstances conspired to injure what was then considered the best description of cattle. In size, in constitution, and in the quantity and quality of their milk, the best animals are not now what they then were. The principal cause of deterioration seems to have been the *general*, and, I may add, the almost *universal* practice of farmers to breed from "small males." Men of education and talent have written in favour of this practice, and men of practical experience have implicitly followed their suggestions. This erroneous principle will explain the degeneration that has taken place among the best description of cattle, and it shall be my object at once to describe and to endeavour to confute both the theory and the practice above alluded to.

In explaining the principle of breeding from small males, we will suppose the male and female to possess equal qualities *in all their respects except size;* and we will also assume that the bull, individually contributes to the formation of the fœtus *at least* an equal proportion with the cow. According to all the known laws of procreation, the produce will partake in an equal degree of the nature of its two parents, and be of a size intermediate between them. By this system, therefore, the size of the offspring is on every descent proceeding in a perpetual decreasing ratio; and in a number of generations, the aggregate amount of these diminutions will be found to be very considerable indeed. For instance, by beginning to breed from a cow of which the average weight of the herd, taking it for granted to be uniuniform, is 70 st. and from a bull of a herd of which the average weight is 65 st. the female produce, as is well known, will be 67½ st. Observe, *that it is not the weight of the bull himself, but the average weight of the race of cows from which the bull is descended, that should be the groundwork of calculation.* Again: the heifer calf, bred as above, will, when old enough, according to this principle, be put to a bull of a herd of cows 5 st. less on an average, and the next generation will have decreased to 65 st. So that, in the course of a few years or generations, the original stock will be reduced in size to such a degree, that little will remain to distinguish it from some herds of small and inferior cattle, except colour and the other characteristics peculiar to the species independent of size.

There are but few persons experienced in breeding cattle, who have not observed variations from this general law of procrea-

tion. Sometimes the small animal produces a large one, sometimes the large one a small one. Such anomalies are accounted for by supposing that the small stock, from which the large one is bred, has descended from a race of cattle formerly large, but rendered small by bad keeping, delicacy of constitution, or some other cause, which an acquaintance with its pedigree might elucidate.

On the other hand, large parents may produce much smaller progeny than themselves, from their being descended from a smaller stock, but become large from extra keeping, or, which is equally probable, from their partaking of the size of a cross which has at some former period been introduced into their ancestors. This is what is generally called breeding back; but all these are exceptions from the established maxim, that "*like begets like*," and are the effects of the caprice of man, produced by a want of regularity and system in the selection of the different animals from which he breeds.

The principal reason why small males have been and are recommended in preference to larger ones, is an opinion which has and does prevail that they are better shaped, and possess more perfect symmetry, but this opinion is in the author's judgment by no means conclusive. It is admitted, however, that their imperfections are less perceptible; but that they do exist in smaller as well as larger animals is equally certain, and would be visible in the former, as well as in the latter, if the scale of the former were enlarged as a picture can be by a pentagraph. The defective parts of the smaller animal would then be increased in due proportion, so as to be observable even by a careless eye. Besides, the bad points of a smaller animal are sooner concealed by fat; and should there be a *failing between two perfect* points, a little extra quantity of fat will soon hide it from the casual observer, but such hidden defects will not escape detection from the finger of a judge.

It will be remembered by some, that after the first great improvement took place in the breed of sheep by Mr. Bakewell, his sole attention was directed to symmetry, leaving out of consideration, size, wool, and constitution as things of minor importance, but experience very soon proved that the parts which had been neglected were of the utmost importance to the farmer, and that sheep could not be deemed good without them. Those who had adopted his principles, therefore, retraced their steps, and whoever has persevered in breeding from sheep possessing the above mentioned qualities, discarded by Mr. Bakewell and the advocates of his system, has been amply repaid by the result.

In the same way that the breeders of Leicester sheep had to retrace their steps, must the breeders of cattle proceed, by adopting a system differing from what they have followed, and afterwards by persevering in that which experience has proved to be

consistent to the laws of nature, and productive of the happiest effects in improving the desirable qualities in cattle. Sheep, it must be observed by coming more quickly round to maturity, more quickly shew an error in their system, and for the same reason any error in sheep is more quickly corrected and they are more easily brought back to their former constitution. But neat cattle require a number of years to make any material alteration in them, either for the better or worse.

There is another system of breeding which has had its advocates, and which should be cautiously abstained from, as entailing the most pernicious consequences—I mean that of "*breeding in-and-in*" It is not now so necessary to give this caution as it was some years ago. The puhlic have perceived the baneful effects of this system, and by many theoretical as well as practical farmers has the bugle of alarm been repeatedly sounded. But if this essay should fall into the hands of breeders who still adopt the *in-and-in* system, let these breeders be reminded by one, who wishes well to his neighbours, that he has seen hundreds of otherwise beautiful animals die as victims to this unnatural and incestuous practice, and that the reasons produced in favour of it are, in the author's judgment, altogether insufficient to establish it as either natural or serviceable. Cattle thus bred have been recommended as being neater in form, as having less offal, a greater inclination to feed, &c. and advocates have referred to animals *feræ naturæ*, in order to show that breeding in-and-in may be carried on with impunity. To these we object, affirming that it has not yet been proved that they are in fact neater in form, &c. and that other beasts may be selected, possessing all these perfections in an equal degree; and experience has taught us that their neatness in form is produced by a shortness in the back-ribs, by diminution in size, and an effeminacy of character. The lightness of offal attributed to them proceeds from a want of a healthy flesh and substance generally and all which are strong indications of a weakened constitution, and of the ruinous consequences of incestuous intercourse.

It is also a notorious fact that beasts so bred are not so certain to breed, though it may be difficult to assign a reason; but if we look to the period before this system was fashionable we shall find that cows then very seldom failed to breed, and that it was then as rare an occurrence for a bull not to propagate as it is now common.

For a few descents I have known herds that have been incestuously bred, without general or great injury being perceptible, and this, too, has led breeders to persevere, thinking that all was right, but the certain effects in every case will and must sooner or later follow, namely a loss of constitution, a reduction in size, general delicacy, and a difficulty in being reared, in many instances so great as to occasion the loss of nearly the whole of a

herd of young stock. It is urged, too, in support of this unnatural system, that the wild cattle in Chillingham, and other parks, which have bred indiscriminately for several hundred years, still possess the same constitutions as ever, and continue to be of the same weight when fat and at a certain age. With equal force are we referred to deer, hares, foxes, &c. and the whole host of animals feræ naturæ. But upon a comparison between those animals that are under the control and will of man, and those in a wild state, we shall discover a very great difference in the modes of breeding pursued by each. Although there can be no doubt that incestuous copulation is occasionally carried on by those wild animals in the parks referred to, yet upon minute investigation it will be found that the male produce of such illicit intercourse seldom has an opportunity of leaving any of his posterity behind him: indeed, it appears as if nature had wisely ordered that it should not be so, as will be shown by the manner in which breeding is carried on among them; for the bull that possesses the favours of all the females is generally, if not always, the most remote from incestuous blood of any in the whole herd. The bull (or captain of the herd) does not gain his right of precedence from hereditary descent, nor yet from age or length of service, nor from colour, symmetry, &c. but *from his muscular powers and muscular qualifications*, each of which must be many times put to the test before he is able or entitled to fill the honorable post; as it is by dint of battle and superior strength that he must be raised to it, and by fighting that he must maintain it. Those who have not seen the desperate battles which these ferocious animals have with each other, will scarcely credit the best authenticated account of them. It frequently happens, that when the bull that has filled the captainship is vanquished by a stronger and more muscular animal than himself, he retires into a sort of voluntary exile, separating himself from the whole herd, as if conscious of his incompetency, and remaining in a retired and woody part of the park, where he appears to have lost his wild and ferocious nature, and will suffer people to approach near to him with impunity. This frequently happens with those that are fighting their way up to the captainship. Here is an example worthy of our mature deliberation, and doubtless from it may be derived results most beneficial. Hence we infer that the inclination to feed, size and constitution of beasts may be preserved by breeding from bulls of muscular powers and stamana, although the baneful cross of incests is not unfrequent, and hence also it is apparent that the milking propensities, symmetry, size and other qualities requisite to the formation of a perfect animal, may be obtained by proper attention to the selection of males.

Having briefly stated our objections to the system commonly adopted, it remains for me to endeavour to point out some other,

by which the breed of cattle may certainly be improved, or at all events preserved. Commencing with the selection of cows, the writer would recommend that they be what is now considered of a large, but not an extreme, size; that they have great inclination to fatten, and possess a handsomely formed udder, with every other milking indication.

These three essential qualities, *size*, *inclination to fatten*, *and ability to give a large quantity of milk*, are in my estimation, absolutely necessary, and should never be dispensed with. There is no objection, nay, it is even preferable for them to be possessed of colour, hair, symmetry and every thing else which the amateur may wish for, but these must be in addition to the three great requisites. In recommending so strongly the ability to give milk, as being decidedly the most valuable quality which a cow can possess, I shall be censured by many as belonging to the "old school." But the tenant, educated at the same school, who is enabled to pay his rent regularly twice in the year from milk, butter, and cheese, and the landlord who as regularly receives the same, will both join in acknowledging that the language which was taught there had at least for its object pounds, shillings, and pence.

In taking a slight glance at the value of butter or cheese made from two cows in one year, the one a good milker, and the other a bad one, we shall be astonished to find that there will be a difference between them of more than ten pounds, taking the average price for the last seven years of butter or cheese. As there is so great a loss in one bad milking cow, there is a proportionate loss in any larger number which a farmer may be so fortunate as to possess. Notwithstanding the very great attention paid to the breeding of cattle, which by many has been termed a menia, the most unaccountable thing in it is the total neglect of this the most important part; and if there was any thing in their conduct deserving the appellation of "mania," surely we find it here.

Gentlemen may buy pictures, but farmers cannot afford to buy cows, merely to look at them and admire their beauty. Milk may be considered as an annually returning product for years. Beef is the fee simple, as it were, sold once it is gone forever. It has been said, that grazing and milking properties cannot be combined. We admit that a cow which gives little milk, generally, from that circumstance, is in great condition, which however to some erroneously appears to prove her superior capability to feed, and causes her to be continued in the herd, under the hope that her produce will excel on the valuable property of feeding.

But when her produce has arrived at maturity and is sold to the *butcher*, the difference arising from the *annual* value of the cow's milk, compared with that of a good milker, should be deducted

from the price for which her offspring is sold, and then a comparison instituted with that of the produce of a good milker, to determine which is the most valuable. It is almost impossible for a cow to give a great quantity of milk and be fat at one and the same time, but let her cease to give milk, and no reason can be assigned why she should not fatten as well as any other cow. Numerous instances might be produced of cows in an eminent degree excelling in *both* properties, among which we will mention a short-horned cow, rather larger in size than ordinary, with a long and fashionable pedigree, possessed of great inclination to fatten, that gave upon an average for 33 successive weeks, the extraordinary quantity of 12lbs. of butter per week, (the weekly quantities were published in the Farmer's Journal and other newspapers,) and all her female offspring were very superior milkers, and also good feeders. Cows that give much milk being generally as before mentioned in lower condition than bad milkers, do not please the *eye:* but bulls ought to be reared only from such cows as are in reality of good symmetry, and possessed of the invaluable capability of giving milk, and thus propagating excellent milkers.

The qualities requisite for the cows to possess having engaged our attention, we next describe the bull. In size he ought to be the *same as the cows*, making due allowance for the sex, which of consequence will cause him to be larger. He should have great inclination to feed, in union with broad, round and deep ribs, and *great substance*, and be so shaped as to lay beef upon those parts that are of most value to the butcher He ought, as said before, (but it can never be too often repeated) to be descended from a good milking cow, and to have such points as are likely to propagate it. Whatever else is desirable as regards symmetry, colour, &c. he may possess, but, *above* every thing else, *let him be masculine.*

Breeding from delicate and effeminate males cannot be too highly reprobated, it is from hence arise delicate constitutions and all their concomitants, peculiarities belonging to a race that cannot bear either cold or wet weather, or bad keeping, or produce any profit even from good keeping.

On closing the subject of *breeding* the author is desirous of adding a few words on the manner of *keeping cattle.* No definite and invariable food is applicable to all seasons and situations, since much must depend upon the quantity and quality possessed by the farmer. It is of the utmost importance, however, so to keep young stock that they may always be improving in condition, because thus is secured that highly desirable attainment—early maturity, the especial object of all the zeal displayed in the improvement of the breed of cattle. Should young cattle be badly kept for one week only, they will lose as much as will require a month to regain. Store stock, having arrived

at maturity, may be kept more frugally, but one young beast well kept will yield more profit than many badly kept. By 'well kept,' the writer does not mean profusely or extravagantly, but, as before said, just so as to keep them constantly improving. Heifers in too high condition are not so certain to breed, and when they do breed will give less milk after calving than others moderately kept, as extreme fat prevents the regular and necessary increase of the lacteal, by the disproportionate growth of the other vessels. Young beasts should be classed according to size and age, and in winter kept in foldyards with open sheds to go into and from at pleasure. Their food is thus sweeter; the exercise they take promotes health and improves their general form, but particularly the manner of supporting themselves upon their legs. It prevents their being sickle-hocked—a defect frequent in young cattle much confined; they also preserve their hair later in the spring, and are better able to bear the cold when first turned out to grass. Young beasts kept in warm houses during winter, make but little progress when first turned out to grass; on the other hand, it frequently happens that they lose, instead of gaining condition, during the first month or six weeks, especially in exposed situations or during wet or cold weather, which at the season alluded to is very frequently the case.

It would lengthen this essay too much, to enter into all the other branches connected with the breeding of cattle; and after all, much of the minutiæ attending it can be gained by experience only. Culley, in his Treatise on Cattle, when speaking of handling, tells us, that there is a peculiar touch requisite, which language cannot define or express. So are there other things difficult to describe. Every practical breeder must be aware of this, and will perceive that the author has given the principal outlines, and leaves the remainder to be supplied by the experience of those engaged in the breeding of cattle.

In the essay now offered to the Manchester Agricultural Society, it will be perceived that the author has refrained from attempting any thing beyond a plain unvarnished statement, and has he trusts expressed his facts in such a manner and in such language as to make himself thoroughly intelligible to farmers. Every thing which has been advanced is the result of considerable and long-continued experience, united with the mature consideration of the practice of other breeders—many of whom are deservedly high in the estimation of the public. The author has had many years of intimate acquaintance with nearly all the principal breeders of cattle in the North of England, as well as attended most of the principal exhibitions of good stock, at many of which he has acted as a judge; which circumstances have afforded him frequent and valuable opportunities of witnessing

the practical effects produced by the various methods pursued by different breeders, and have enabled him to arrive at the conclusions which he humbly submits to the consideration of the Manchester Agricultural Society.

ART. III.—*To John Hague, Engineer, for certain improvements in the method of Expelling Molasses and Syrup from Sugar. Dated December* 6, 1828.

[From Reports of Patented Inventions.]

I, the said John Hague, do hereby declare, that my invention consists in expelling the molasses or syrup from sugar, by occasioning a pressure of the atmosphere on a surface of the sugar, and this I do, either by withdrawing the air from the under surface, or by compressing this air on the upper surface of the sugar. When I do it by the first method, that of withdrawing the air from the under surface, I make use of a trough or box, (open at the top,) either square, round, or any other proper shape. I prefer having it larger at the top than at bottom, in order that when the sugar shrinks, by the expulsion of the molasses or syrup, it may, by sinking, keep tight round the sides, and thereby prevent the rapid passage of the air between the sugar and the sides of the trough or box.

In this trough or box, at a few inches, or any proper height from its real bottom, I put a false bottom, made of any proper material, (but I prefer sheet copper,) and thickly perforated with small holes; on this false bottom I place a cloth or webb, made of hair or some other material.

To the real bottom, or sides of the above described trough or box, I fix one end of a pipe or tube, the other end of which I fix to the upper side, or some other part of a receiving vessel, placed at a convenient distance below the trough or box. This receiving vessel I furnish with a cock, or some other contrivance, for the convenience of drawing off the molasses when desirable or necessary.

From some part of the above described pipe or tube, I branch off a tubular arm, which leads to an air pump, fixed at any distance from the already described apparatus. The construction of an air pump is so well understood by mechanical persons, that it needs not here being more particularly described.

The operation by this method is as follows:—

I spread the sugar about three inches deep, or any other proper depth, all over the cloth or web that covers the false bottom of the trough or box, taking care that the sugar comes close to the sides of the trough or box, all round. Next, by means of a water wheel, wind mill, steam engine, animal strength, or other power, I set the air pump to work, which partially exhausts the air from the other parts of the apparatus. A partial vacuum being thus formed underneath the false bottom of the trough or box, the pressure of the atmosphere, and the passage of the air through the sugar, separates and expels the molasses, which passing through the cloth or web, and the perforations in the false bottom, falls on the real bottom of the trough or box, and is from thence conducted, by the pipe or tube, into the receiving vessel below. This operation I continue, by keeping the air pump at work, until the molasses or syrup is sufficiently expelled from the sugar.

Before, or during the process, I sometimes find it desirable to moisten the sugar with water, lime water, or some other liquid.

When I do it by the other method, that of compressing the air on the upper surface, I make use of a trough or box, covered on the top, which I furnish with a false bottom, and cloth or web, as by the first method. The expelled molasses I convey from this trough or box, through an aperture, pipe, or tube, to any vessel, or place, destined to receive.

The operation by this process is as follows:—

Having prepared, and on the cloth or web, the sugar to be operated upon, as by the former method, I, by means of a force pump, bellows, or some other contrivance, worked by some power, either natural or artificial, compress the air on the upper surface of the sugar, which produces the same effect on it as the operation first described.

ART. IV.—*Essays on Agriculture; by* F. A. ISMAR.—*No.* 3.

[FROM THE AMERICAN FARMER.]

In my first number I have spoken of dung-means, and shall here endeavour to show how they are to be applied.

Lime has an admirable effect on heavy, humid, and hard clay grounds, acid meadows, &c. The best proceeding with it seems

to be the following: to one part of lime, add seven parts of earth, lay them in strata, and pyramidally over each other; cover them with sods, and let it ferment a few days in this state, which is forwarded, by soaking them sometimes with dung-ley. After two to four months it is the best dung, and is strewed previous to sowing over the fields, or over the young grass of meadows, a short time previously to an expected rain. The advantageous consequences show themselves in a short time with most of the crops, f. i. wheat, rye, barley, oats, turnips, clover, peas, beans, &c. Bad meadows receive a new life, when broken up in the fall, ploughed in crosses, strewed with this mixture, and then harrowed. Soon all weeds disappear with the hordes of insects, and the soil obtains a new force and fertility for artificial meadows.

The essential parts of *marl* are clay and lime; it boils up with acids and dissolves in them now to the moiety, then to the fourth or sixth part. It forms a loose earth, and is easily pulverized with the fingers. Exposed to air it falls soon into powder, its ordinary colour is bluish grey. The yellow, brown, and red marl has too much iron, which diminishes its good qualities. It is found every where under the soil at some fathoms deep, but most in swampy countries, on the banks of rivers, and in declivitous fields. The clay marl is best on hot, limy and sandy soils; the sand marl for humid land. Its effects last many, often from six to ten years, and more powerfully at the latter than in the two former years. Ordinarily it is strewed pure, and not too thick over the young green plants. Sandy or gravelly land covered with marl is most fit for good artificial meadows. A good marl compost is prepared with ten parts of marl, one of lime, and one of dung: the first stratum is marl, the second lime, the third marl again, then dung, and finally marl; which are often soaked with ley, and thus after three months give a recommendable manure. In order to make it fit to uphold its good qualities for agriculture, burning is the best, as with limestone. Not requiring a strong heat, all kind of wood, small fagots and straw can be used in the open fields. In adding wood-ashes it gains still more. This burnt marl mixed with earth sods, potatoe vines, bean haulm, dirt of the streets, ashes, &c. gives after a fermentation in two months a good manure, which is of great service to turnips, potatoes, &c. But the *misuse* of marl is to be avoided, i. e. year after year, during a long series, marl should not be brought on the fields; the first crops are in such cases very rich, the latter very poor, because none of the powers of the soil exhausted by the plants are replaced by other matters. Marl should only be used every sixth year on the same field, and betwixt those periods should be mingled with other manure.

The plaster, an earthy middle salt, consisting of sulphuric acid and lime is difficult to dissolve in water, and has no taste.

Its colour is white, grey, bluish, yellowish, and blackish; now in fasers, then in scales, or in grains or regular. It is used pulverized, and incredibly favourable to the vegetation, particularly of clover, peas, and herbs. It is best to strew on an acre as much plaster, as is generally sown of oats; calm evenings are to be chosen for that purpose, in order that the plaster may keep itself to the surface. Burnt, it loses indeed a fifth of it weight, but it becomes more powerful and is therefore more fit for heavy soils. In light ones, contrarily, it is best used unburnt. The plaster powder is to be strewed on the ploughed land previous to the sowing. The harvest of wheat, Indian corn, rye, oats, linseed, buckwheat, &c. become remarkable by it. The effects of plaster are increased by a mixture, f. i. of three parts of plaster, with three of soot, and ten of wood-ashes; after a fomentation of two months and a frequent soaking with dung-ley. The best use of plaster is nevertheless to throw it in the ley reservoir and to soak the seeds in it. Chalk being but a porous limestone, bears almost the same treatment as the latter. Ground, it makes the soil firmer and more cohesive, and is useful wherever the soil possesses not too much chalk already. The powder is strewed over the pasture herbs, and used like the marl with the various kinds of grain. The burned chalk is still more advantageous on loamy soils. One part of chalk with four of dung, and fifteen of swamp dirt, placed in strata in the indicated succession are an excellent compost. Salt has been recognized in latter times one of the best dung-means; but it must be applied in just quantity. In salt fabrics in Europe a peculiar dung-salt is prepared, whose prominent qualities are, to keep the plants very healthy, and the soil clean from weeds and vermin; to render the plants less sensible to the change of climate, and to ripen them three or four weeks sooner than ordinarily is the case. Salt is said to have principally the quality of keeping the moisture longer in the soil; an object of high importance for sandy soils. To this end it should come into the earth early in the spring. The harvest becomes richer by it at least for the third part, if not for the moiety. In gardens and fruit plantations its utility is equally great. In Germany, I saw the following rule most generally admitted; to strew equally on a journeyman's work for wheat and rye, after having been harrowed, from 8 to 1200 lbs. in loam soil, from 10 to 1500 lbs. in lime or sandy ground; for barley, oats, peas, and beans, the moiety at that quantum, in January and February; for turnips and all succulent plants the same at the same time; for meadows 500 to 800 lbs. in the fall and not later than November, for potatoes if not manured 50 to 1000 lbs. in January or February; but if used only when planted, it must be done when the plants are already up; for hops 1500 to 2000 lbs. in November or December; for teint plants as for summer grains. All these quantities of salt are only necessary in the first year; with

every succeeding year they must be lessened to a third part of it. The panstore, also a produce of the salt fabrics, is moulded and used like the salt. The ashes of salt is used also for field and garden plants. Six parts of this ashes, with twenty-five of vegetable earth, and five of lime give a very good compost. Nitre, and ashes of nitre, can only be used when dissolved or mingled with ley of ashes, soot, and vegetable earth, f. i. 6 lbs. rough nitre, 20 lbs. of soot, and 12 buckets of ley, boiled in a big pot during 30 minutes and continually stirred; thus soaked on the cord of vegetable earth, placed in hills, and after a fortnight strewed on the land. The ashes of saltpetre is a mixture of earth and leeched wood ashes. The earth is taken from sheep stables and other places where nitre is produced. It is examined by aquafortis, which determines its quality after the quantity of dissoluble parts which must be at least 30 per cent. It proves of beneficial influence in connexion with other substances, principally vegetable earth, when strewed on the ground.

In heavy and tenacious soils the ashes of wood are of great utility, also on bad and sour meadows. It destroys likewise mosses, and all obnoxious plants. The drier the ashes, the more powerful it is. Each agriculturist should be very attentive to it, burn all obnoxious or useless wood, plants, &c. and use the ashes. Previous to a rain it is strewed over meadows, clover and pasture lands. On grain fields it is in dry weather brought on the rows of the ploughed land and harrowed in previous to sowing.

Pot ashes is still more effectual; but its high value allows of its use only in connexion with other dung-means, f. i. 6 lbs. of pot ashes, 20 lbs. of salt, boiled in 12 buckets of ley and soaked over two or three cords of vegetable earth. Bleachers should therefore not neglect pot ashes; but boil the ley, mingle it with vegetable earth and procure in this way a valuable manure. The ley of soap houses and pot-ash manufactories are almost of the same qualities. Mingle with two parts of dung, and ten of earth, often stirred, and after a rain strewed on fields or seeds is the best, principally for a loamy soil or sour meadows. The ashes of tobacco does the same service, and destroys undoubtedly all vermin, also the ants, which are so injurious to trees.

The ashes of turf, anthracite coal, and charcoal, are very useful, but must be well distinguished from the ashes of limestone and bricks. The former is only applicable on a sour loam ground and cold sods; the other on grounds of the contrary properties. Charcoal is an eminent dung-means, if not too dear, in vineyards, mustard, and tobacco fields, &c. Burnt clay, mingled with some ashes of lime, turf, or marl ameliorates, loosens, dries and fertilizes a deep and heavy loam ground. The effect of burned clay increases in proportion as the soil is more swampy, cold and sour. It is strewed on seeds and meadows, or harrowed in with the seeds after ploughing. Its advantages are the most obvious

on grain, linseed, potatoes, and turnip fields. It is burned like limestone, but with a less fire. All kinds of shells consist greatly of lime, and are of the greatest use, as I have already indicated. Often they are found already in a state of decomposition, and are then very useful.

Each agriculturist should at first examine his ground, whether it is composed of lime, clay or sand. By attention to this he will soon discover that by mingling the various kinds, f. i. clay with lime or sand, he may greatly improve his soil. In this respect the opposed kinds of earth strewed on the ground, is always of great advantage; for the vegetable earth has continually much of the principal earth, f. i. on a limy soil the vegetable earth contains always lime, and in addition of that matter would be as injurious as clay or loom would be obvious. To put new vegetable earth on the fields is still the best, and an industrious farmer fears not the fatigue of seeking it in the forest.

Each composition of various dung matters and dung-means, is really a compost dung. In earlier periods it was called dung magazine, where every thing was collected on one spot in order to putrefy there. Now there is more care in this respect in different countries; for only such things are collected on one hill which best mingle and ferment together, and which, as experience proves, give the best dung. A general compost hill is now a hill of lime, mortar, remains of plants, ley, ashes, and some vegetable earth, sometimes turned and often soaked with ley. In two or three months the best dung is always obtained, and this compost is therefore an excellent dung-powder for all fields and seeds. All the artificial composition, known as dung arcana, dung-salts, dung-powders, &c. have already lost all consideration in the eyes of reasonable farmers, who understand perfectly well to prepare themselves the best kinds of manure and dung-powders. In my next I intend to conclude my essays on manure, by examining some articles not yet mentioned, and making some observations on lime, and the manner of using manure.

PART III.

MISCELLANEOUS INTELLIGENCE.

Experiment on Vegetation.—The celebrated chemist, Professor Doberein-er of Jena, has made the following experiments on the vegetation of seeds. Two glass vessels were procured, each of the capacity of 320 cubic inches, and two portions of barley were sown in parts of the same earth, and moistened in the same degree; they were placed one in each vessel. The air was now exhausted in one, till reduced to the pressure of 14 inches of mercury; and condensed in the other, till the pressure equalled 56 inches. Germination took place in both nearly at the same time, and the leaflets appeared of the same green tint; but, at the end of fifteen days. the following difference existed:—The shoots in the rarefied air were six inches in length, and from nine to ten inches in the condensed air. The former were expanded, and soft; the latter rolled round the stem, and solid. The former were wet on their surface, and especially towards their extremities; the latter were nearly dry. I am disposed says M. Dobereiner, to believe that the diminution in the size of plants, as they rise into higher regions on mountains, depends more on the diminution of pressure than of heat. The phenomena of drops of water on the leaves, in the rarefied air, calls to my mind the relation of a young Englishman, who, whilst passing through Spanish America as a prisoner, remarked that, on the highest mountains of the country, the trees continually transpired a quantity of water, even in the driest weather, the water falling sometimes like rain.—*Bibliotheque Univ.*

Grain and Bread found in an Egyptian Tomb.—M. Passalacqua having found a quantity of grain in an Egyptian tomb it has been carefully examined by MM. Julia Fontenelle, Le Baillif, and Kunth, who have determined it to be common wheat (Tríticum satìvum.) M. Raspail, however, differs from those naturalists, and, by more minute examination, has satisfied himself that it is barley, which has been subjected to a considerable degree of heat: and, on torrefying some fresh barley, it assumed the same appearance with the Egyptian grain. Along with the grain was found some bread apparently unleavened. M. Raspail supposed the tomb to be that of a high priest, and refers to Leviticus ii. 14, 15, in which it is ordered to offer "green ears of corn, dried by the fire, even corn beat out of the full ear." Some Egyptian grain in the museum of Charles X., however, is certainly wheat, with some grains of torrefied barley mixed with it. Specimens of bread, in this museum, are similar to that found by M. Passalacqua.

Bulletin des Science.

The soil best suited for Longevity in Fruit Trees is a light sandy bottom, for instance, the wood is never so strong as in strong loam, and not so apt to be infested with the worm in the roots: in such soil as this, well cultivated every year, they will maintain their vigour for many years.

What I mean by well cultivated is, the ground kept continually removed by cropping it with such crops as will tend to improve its texture; such as potatoes, turnips, peas, beans, &c., and every four or five years a crop of

buckwheat, to be ploughed in, when in bloom; this will be found to be of great service to both land and trees; as for corn, clover, timothy, orchard grass, and such like, they ought never to be suffered to be cultivated in an orchard.

It is much better to have 100 trees of good kinds, such as you want them for, well cultivated, than 500 or even 1000 neglected to take their chance, as is often the case when ground is cheap.

Great care is required in preparing the ground for an orchard.

American Farmer.

Pasture of Plants.—Every plant requires a given quantity of earth to nourish it, into which its roots extend for that purpose; and the quantity thus required is called the requisite *pasture* of the plant. Some require more earth and some less. Some require a greater superficial extent with less depth; while others require a greater depth with less superficial extent.

For instance, a plant of Indian corn requires a superficial extent of, say, three feet in circumference, and a depth of six inches; while a root of the beet, carrot, or parsnip kind, requires a superficial extent of, perhaps, only twelve inches in circumference, but a depth of, say, fifteen inches. A plant of flax, on the contrary, will not require more than six inches in circumference, and five inches in depth

It will probably be found, that the greater depth is given to all plants, the less circumference they will require; that the roots will, in that case, shoot further downwards; and, therefore, the deeper you plough, the thicker you may sow. This is a matter of nice calculation, and well worth the attention of the ingenious Farmer.

In order to elucidate this, the proper method is, to try various plants in beds of the same soil, culture, and dimensions, but dug of different depths, and the plants set at different distances, and then the results will lead to the truth.

Thus, for instance, make four beds of carrots, which shall be dug equally well eight inches deep; let the roots in the first bed stand at the distance of four inches from each other; those of the second, at the distance of six; those of the third, at the distance of eight; and those of the fourth, at the distance of twelve inches; and then let it be ascertained which bed has the greatest weight of carrots.

In the mean time, have four other beds dug twelve inches deep; and four more dug eighteen inches deep; and plant one of each of them at the respective distances above mentioned, and ascertain what is the result of each. The same experiments can be tried with equal exactness on most other plants, and the results equally well ascertained.—*N. E. Far.*

Vegetable Curiosity—An advertisement in the Gardener's Magazine states that there is to be seen at Mr. Youl's nursery, an *orange*, an *olive*, and a *jessamine* growing on the same stock.

Preservation of Tomatos.—Mr. Fessenden,—As Tomatos, have, at last, become common in our market, I sent you a recipe for preserving them during winter. Besides the numerous modes of preparing this delicious vegetable for the table, it may be stewed, after being pealed, with sugar, like cranberries and goosberries, producing a tart equal to either of those fruits. Try the experiment and be satisfied. Your most obedient serv't.

H. A. S. Dearborn.

Brinley Place, Aug. 14, 1830.

Extract No. 34, *from the Annales de la Societe d'Horticulture de Paris.*—Method of Preserving Tomatos—"The boiling required for the preservation of fruits, always changes their quality, and sometimes entirely alters their character; and it often happens, when the fruits are acid, as the Tomato, that they imbibe in the copper vessels, in which they are stewed to

a certain consistence, metallic principles, which are injurious to health.—This double consideration induces us to publish an excellent method for preserving the tomato, which does not alter the quality of this fruit, and does not require the action of heat.

"A sufficient quantity of salt is dissolved in spring or river water to make it strong enough to bear an egg; select perfectly ripe tomatos, and place them well and without pressing them in a stone or glazed earthen pot, which is to be filled with the brine: cover the pot with a deep plate in such a manner that it presses upon the fruit, and by this simple process tomatos may be preserved more than a year without attention. Before cooking them they should be soaked in fresh water, for several hours."

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Management of Pigs.—The following experiment was made by a gentleman of Norfolk. Six pigs of the Norfolk breed, and of nearly equal weight were put to keeping at the same time, and treated the same as to food and litter for about seven weeks. Three of them were left to shift for themselves as to cleanliness; the other three were kept as clean as possible by a man employed for the purpose, with a curry-comb and brush. The last consumed in seven weeks fewer peas by *five bushels*, than the other three; yet they weighed more when killed by two stone and four pounds (thirty-six pounds) upon an average, or six stone twelve pounds upon the whole.
London Paper.

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Feeding Cattle.—'In young growing animals the powers of digestion are so great, that they require food which is less rich, than such as are of mature age. They also require more exercise. If rich food is supplied in liberal quantities, and exercise withheld, diseases are generated, the first of which may be excessive fatness: growth is impeded by very rich food, for experience shows, that the coarsest fed animals have the largest bones. Common sense will suggest the propriety of preferring a medium course between very rich and very poor nutriment.'—*Loudon.*

Regularity of feeding cattle is of prime importance. Three times a day precisely at a certain hour, cattle, according to Mr. Lawrence, should be furnished with their food. Mr. Deane observed, that neat cattle and horses should not have so much laid before them at once as will quite serve to fill them. The hay they have breathed on much, they will not eat up clean, unless they are very hungry. It is best, therefore, to fodder them twice at night, and twice in the morning. Let neat cattle as well as horses have both light and fresh air let in upon their fodder when the weather is not too cold and stormy to allow the windows to be open. What one sort of cattle leave should be thrown to another sort. Those that chew the cud will eat the leavings of those that do not, and *vice versa.*

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Curing of Hay.—To Farmers.—A writer in the Norwich Courier says—"If grass when mown, is carefully turned every day it will injure very little. The great cause of injury is its laying on the ground through a long spell of rainy weather. If it lay more than one day, it becomes mouldy, and turns black. If carefully turned daily, 'rain or shine,' it will not lose colour. This is the result of many years experience.'—*N. E. Farmer.*

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Silk Worms.—It is stated when the leaves of the mulberry tree have been nipped by frost, or when the worms are hatched before the leaves put forth, they may be fed upon the dried leaves of the mulberry, gathered before the frost commences in autumn. The leaves must be dried in the sun, by spreading them on large cloths; after which they must be reduced to powder. When it is necessary to feed the worms, moisten the powder with water very gently, and put a thin coat of it round the young worms, which they immediately begin to feed upon. This is likely to prove useful to those who are engaged in cultivating the Silk Worm, in our state.—*N. Y. Var.*